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Chairman

Five Years of Employee Representation Under "The Bethlehem Plan"

EUGENE G. GRACE
President

BY JOHN CALDER*

IT is a truism in industry today that "the employee, like his employer and the nation, reserves the right to make his own mistakes."

It has been hard for most employers in the past to accept that truth and there are still not a few unbelievers whose wish is father to the thought. Before the war this "right" was exercised either by employees individually and inadequately, with individual consequences, or collectively through unions with destructive mass conflicts.

J. M. LARKIN
Assistant to President

Rarely was there any effective provision for collective representation of the whole body of employees in a plant, regardless of the external affiliations of some of them or the lack of such affiliations. Yet, though unions varied greatly in the quality of their intentions, they were in the main correct when they claimed that the greatly preponderating non-union men were practically disfranchised economically under *conditions where the employer insisted upon making all of the mistakes.*

In the six years since 1917 a change for the better, greater than is generally realized, has come over the industrial scene and the industrial temper. There have been many prophets true and false and numerous interesting experiments. But there have been also genuine cooperative ventures, in a new spirit of employees and employers, which already have passed the experimental stage and the story of which "can now be told."

An Independent Investigation at First Hand

One of these in particular aroused the writer's interest; one of the most notable and the oldest of the conference committee plans in the steel industry or in any industry—a pioneer in fact about which only bare outlines were known hitherto. Recently he was permitted to examine its working in his own way, to apply to it all of the tests which long practical experience could suggest, and these tests were applied impartially to officers and laborers.

The results disclosed by close scrutiny of the Bethlehem Steel Corporation plan now at work in many plants were so gratifying that permission was asked to have them independently recorded for the first time. The information and conclusions are set down here for the enlightenment of that large majority of employers who still halt between two opinions, and for the encouragement of those who are moving in the matter.

To go to Bethlehem as a stranger, to live in it, to talk to "the man on the street," to meet the corporation's workmen there and elsewhere in free intercourse

**Consulting engineer, Lexington, Mass. Mr. Calder was the logical person to undertake a survey of "The Bethlehem Plan." He was trained in the steel industry of Scotland and is an honor graduate of the Royal Technical College. For 20 years he managed well-known American plants, including those of the Remington Typewriter Co. and the Cadillac Motor Car Co. He acquired a national reputation in labor management and was called to be the first manager of industrial relations of Swift & Co. with over 100 plants. There, during several years, he developed policies and made a marked success of employee representation, of the organization and education of foremen and executives, and of personnel services. He is now in practice as a consultant. He has been a welcome contributor to* THE IRON AGE *and is an active member of the American Society of Mechanical Engineers, the Society of Industrial Engineers and other professional bodies. His recent book, "Capital's Duty to the Wage Earner," covering the whole field of industrial relations has attracted wide attention as a constructive and illuminating contribution by a forward-looking, practical man.*

about their employment relations, and to have thereafter full access to the labor records and officials for confirmation, is to discover that both tell the same interesting story and that five years after its inception the worker outdoes the official in his enthusiasm for the plan.

The Beginnings of the Plan

What was the setting for that which was at first only "the Bethlehem experiment?" Briefly this:

After the years of alternating union and employer domination which characterized American industry, the war demanded industrial peace. But the conference committee system set up at the Bethlehem plant in the fall of 1918 by the War Labor Board was in no sense representative of all the workers. It steadily lost the respect of both employee and employer, while at the same time the Steelton, Lebanon and Maryland steel plant employees of the corporation, not being under War Board regulation, were free to feel their way to some better plan of working. They actually did so a full year ahead of the findings of the President's Industrial Commission of 1919, which advocated employees' representation in the plant as the only way in which the interests of all could be properly safeguarded. In fact, more than five years ago, or as early as April, 1918, the Bethlehem Steel Corporation, facing the problem of keeping touch with steadily increasing forces, had decided to introduce a liberal scheme of representation whenever its employees desired such a plan.

Representation Basis

In October, 1918, the employees of the Steelton, Lebanon and Maryland plants, in conference with the company representatives, adopted that mutually acceptable scheme known as "The Bethlehem Plan" and, though employees and management in each plant group are free to alter the plan to suit their conditions, it has not been modified materially in the five years since its inception.

In its issue of Oct. 24, 1918, THE IRON AGE published the rules of the plan in full and it will suffice at this time to state the basis of representation:

Plants employing under 1500 employees—one representative for each 100 employees.

Plants employing 1500 to 10,000 employees—one representative for each 200 employees.

Plants employing over 10,000 employees—one representative for each 300 employees.

Provided, however, that in no case shall there be less than 10 representatives.

Eighteen years of age and 60 days' employment qualifies for voting. Twenty-one years of age and six months' employment, with citizenship or first papers, qualifies as a candidate for election. Company officials and those hiring or discharging are disqualified.

The success of the plan at the three steel plants named above was in marked contrast to the inefficiency of the War Board committee system at the main Bethlehem plant, which was practically manipulated in the interests of a small organized minority.

When the steel strike of 1919 was called on the plea that the industry was a "non-conference" one, organized labor, constituting only a small fraction of the Bethlehem plant, promptly threw the Government's conference committee system overboard and pressed the issue independently and by force, while the corporation adhered strictly to the agreement with the War Board. Nevertheless 90 per cent of the employees and most of the elected committee men adhered to the company. Perceiving that the board had lost faith in its own badly handled plan, the employees who had been quick to sense its undemocratic working requested that the Bethlehem plan in successful operation for nearly a year at the company's other three steel plants be adopted at the main plant hitherto dominated by the War Labor Board.

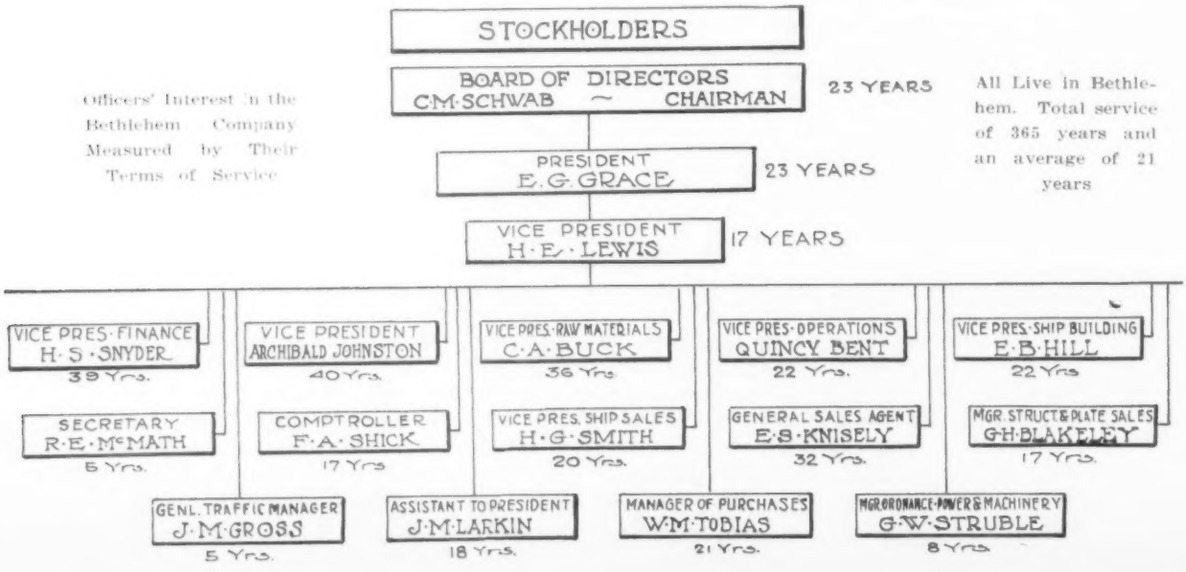
By October, 1919, this had been effected to their satisfaction and the plan has now functioned there for nearly four years, at the others for about five years, and has been extended to numerous plants which have been acquired since.

Procedure for Settling a Grievance Originating with an Employee

The Growth of the Corporation

Twelve years ago the corporation employed about 11,000 persons. At the present time the payroll force is 76,000 persons distributed as follows: Seven steel plants—Bethlehem (Bethlehem, Pa.), Steelton (Steelton, Pa.), Lebanon (Lebanon, Pa.), Maryland (Sparrows Point, Md.), Lackawanna (Buffalo), Cambria (Johnstown, Pa.) and Coatesville (Coatesville, Pa.), employing 55,000 people are happily functioning under the plan, as well as six of the seven shipbuilding plants employing 12,000 people, viz., Fore River (Mass.), Sparrows Point (Maryland), Baltimore Dry Docks (Baltimore), Simpson Dry Docks (Boston), Harlan

Officers' Interest in the Bethlehem Company Measured by Their Terms of Service



All Live in Bethlehem. Total service of 365 years and an average of 21 years

Chairmen of Employees' Representatives at Twelve Bethlehem Plants

OTTO MEYERS,
Baltimore Dry Docks

GEORGE D. GINGRICH
Lebanon Plant

CLINTON KOCH,
Bethlehem Plant

FRANK COLUMBUS
Lackawanna Plant

ADAM GIBSON,
Cambria Plant

JOHN JOLLY
Moore Plant

ROBERT C. MCGEE,
Baltimore Plant

WILLIAM SMITH
Fore River Plant

JAMES MOORE,
Harlan Plant

FRANK J. LOWRY,
Coatesville Plant

THOMAS F. LYNCH,
Steelton Plant

Work at Which Employees' Representatives Are Engaged and Length of Service with the Bethlehem Corporation or a Predecessor Company: Otto Meyers, machinist, 23 years. John Jolly, machine shop disbursing clerk, 3 years. Thomas F. Lynch, acetylene welder in open-hearth department, 6 years. George D. Gingrich, heater, 21 years. Robert C. McGee, puncher and shearer, 27 years. Clinton Koch, boiler shop templet maker, 41 years. William Smith, clipper and calker, 7 years. Frank Columbus, locomotive engineer, 19 years. James Moore, sheet metal worker, 12 years. Adam Gibson, blast furnace storehouse man, 34 years. Frank J. Lowry, alternate night foreman in machine shop, 22 years. J. Howard Burns, machinist, 30 years

J. HOWARD BURNS,
Maryland Plant

(Wilmington, Del.), and Moore (Elizabeth, N. J.) plants. A council for the Union plant at San Francisco will soon be organized. In addition, the corporation owns and operates mines and quarries employing 9000 persons at Ellsworth, Heilwood, Preston, Marion, Johnstown, Cornwall, Pa., and elsewhere. The maximum force has sometimes exceeded 100,000 persons and has been of such variety of crafts, conditions and nationality as to test out the Bethlehem plan thoroughly over a period of years.

Problem of Increasing Forces

Rapid growth in number of employees and plants has presented executive problems also. The Bethlehem idea has had to be solidly "sold," not only to new groups of workers but to plant executives of all ranks new to the corporation and some of them accustomed to other and autocratic methods of handling the human factors in industry. For these reasons the corporation confined itself chiefly to publishing the outline of its plan. It has exhibited a wise reticence about results and has not indulged in prophecy. President Grace's statement to the employees' representatives two years ago in response to some inquiry as to absence of publicity reveals the sincerity and caution upon which the plan was founded. He said: "We are going to see that the plan is approved on all sides before it is given to the public in general. We have hesitated to publish details for the reason that, when we do, you men have got to be in full accord with us. When you believe in it, and when we feel that our employees believe in it, and we have something that is good for the general public to have, the day you join with us we will let the public know about it." That day has arrived, but the corporation has preferred to allow the impartial observer to appraise this great effort and its results.

What is Unique in "The Bethlehem Plan?"

It is, in a sentence, that the workers individually and collectively in any plant, if properly energized, enlightened and led, can be trusted to make their own mistakes and can be relied upon to make very few of them. That, as a principle, is at the root of many different plans, but the extent to which it can be given application varies with the actual state of the industrial relations in individual companies and plants and with the extent to which the employer is willing to participate in the economic education of his employees. It is no fault of many good plans that they obtain employee cooperation very slowly, and that to protect against unwise action the checks and counter-checks of joint conference are interposed. In certain situations common sense demands it and where education is not a major feature in company policy, as it ought to be, such a situation may be perpetuated. In any case it is little affected by welfare work, however extensive and excellent.

The Bethlehem plan may be summarized very briefly. Elected employee representatives operating by themselves, with negotiating powers through committees of their own choosing, and also in appeals through joint committees with appointed management representatives, pass upon every matter arising out of the employment relationship which has not been satisfactorily settled in the first instance with the ordinary plant authorities for individuals or for groups. They

also discuss and make constructive suggestions upon matters for the good of the business that are in no sense grievances, but in which the employee is found to be keenly interested and helpful.

The unique feature of the Bethlehem idea is that the employees of each of its plants are *trusted* to organize as a body, to meet through their collective representatives of their own choosing and to formulate their opinions or requests. In all this they have full access to the company's information, with the assistant to the president at headquarters and his special representative at each plant devoting themselves to the work and available at all times for conference. In other words, there is not the slightest attempt at the initial stage of any issue to condition the arrangements under which the whole representative body of the employees or any committee of that body may thrash out the matter among themselves.

Ample provision for review by joint committees is made, should either employees or employer desire this, and also for appeals beyond that stage. But the outstanding fact is that the Bethlehem Corporation has such convictions behind its own intentions and ideals and such a grasp of the employee's psychology that it has been content for five years to trust to the good faith and common sense of large groups of English speaking and non-English speaking workers, with the happiest results.

In various industries many excellent representation plans founded on joint conference of equal numbers of employees and foremen are functioning today and promoting the mutual education and forbearance of these closely related groups. A few others exist professing greater democracy and tying up to profit sharing and rather arbitrary final control. But Bethlehem invites its employees with no offer of pecuniary reward to develop keen interest in *their own economic relationships* and to do it *with no more assistance than they desire and with no controlling hand upon their deliberations by the employer.* That measure of faith is heartily reciprocated in the atmosphere which this corporation, by the nature of its organization and personnel, has created, and the character of this atmosphere is naturally the next point of inquiry.

Bethlehem Officered by Veterans and Home Folks

As has been indicated, the pioneer Bethlehem plan after five years is in its main features no longer unique. It has had many imitators and its success compared with some of these has to be sought in other things than in mere form, though the untrammeled employee conference in the first instance about all issues is still unusual.

One of the reasons for the atmosphere of confidence is the fact that at the headquarters of the corporation in Bethlehem the officers are all residents and are veterans in the service of the steel company whose joint terms cover nearly four hundred years. The diagram on page 1690 shows at a glance that, headed by Charles M. Schwab, chairman, and Eugene G. Grace, president, there is not a suspicion of absentee control or unsympathetic distance possible in the minds of the workers, many of whom have personal acquaintance with the officers and have seen their steady rise from the lowest positions through meritorious performance to their present responsibilities. The unfortunate reaction from absentee ownership in industry is sometimes unavoidable, but it is rarely so, for executives, necessarily so placed and with the right spirit, can see to it that their technical and operating plant executives are of a type calculated to forward and realize their ideals.

This is amply provided for in the Bethlehem official family. The democratic attitude and feeling of the big chiefs has become the equally genuine practice of the managers, superintendents and foremen in its many plants and is a pleasing contrast to the traditional autocracy of the "boss" in various industries. Every genuine conversion to "leading" instead of "driving," to "understanding" instead of "aloofness," is an aid to employees' representation and every camouflage of sympathy and interest is a nail in its coffin. The workman cannot be fooled and pretense or ulterior motive

LONG before it adopted employee representation the Bethlehem corporation had an industrial relations department which carried on a wide range of so-called welfare or betterment work. All this is actively prosecuted today. Many interesting illustrations might be presented, showing what is being done in apprenticeship, in pensions, housing, first aid, athletics, bands and choruses, playgrounds, etc. But as this article is centered on employee conference and representation, only two examples can be given of welfare activities. On this page is shown a group of foreign-born employees attending a plant school in which they learn English. On page 1695 are some results of the company's naturalization work

Management Representatives Dealing with Industrial Relations at Twelve Bethlehem Plants.

(The Representative at Baltimore Dry Docks Acts Also at the Sparrows Point Shipyard)

N. B. LUDLUM, Lackawanna Plant

H. W. ZOOK, Steelton Plant

C. L. BAKER, Cambria Plant

J. K. ROBINSON, Bethlehem Plant

J. E. CULLINEY, Lebanon Plant

J. M. MAXWELL, Coatesville Plant

H. E. PARKER, Fore River Shipyard

H. B. DAVIDSON, JR., Baltimore Dry Docks

H. J. WOODWARD, Harlan Plant

HOWARD C. PRICE, Maryland Plant

WALTER F. DOHERTY, Moore Plant

is soon uncovered. The Bethlehem official family are all sincere boosters of the plan and genuine exponents of its virtues and its moral implications.

Employees Invariably Choose Ability and Experience to Lead Them

What about the employees? How do they perform when left unfettered to "make their own mistakes"? Well, whether a Bethlehem plant has fifteen thousand or one thousand men, the writer has found that they take their representation responsibilities most seriously, consider office an honor to be sought and elect only able fellow-workmen with years of experience. As a matter of fact over ninety per cent of the employees take part in elections. In the Bethlehem main plant the average service period of the 98 elected workmen is twelve years and the average over all plants is eight years, though one year qualifies for office. Rome was not built in a day; neither was the Bethlehem plan "sold" to the corporation's employees by a few fine gestures. Nevertheless it has been thoroughly sold to 70,000 workers who remember the old bad days of "catch 'em young, treat 'em rough and tell 'em nothing." These workers appreciate the new spirit and recollect how much better the plan functioned than the war-time committees when they operated simultaneously, how it weathered the steel strike, the slump of 1920 and the succeeding boom, with harmony, mutual respect and satisfaction in all the adjustments that were necessary.

Men in the Limelight

The group of portraits on page 1691 shows the type of workman who is brought to the front by employees bent upon having the best to represent them. These are the present general and committee chairmen who guide their deliberations.

The three officers particularly concerned in Bethlehem's industrial relations are Chairman Schwab, President Grace, and J. M. Larkin, the assistant to the president, whose duties as liaison officer with labor are considered of the highest importance and are so honored. Some day all wise corporations will so choose and distinguish the man who becomes their labor conscience and remembrancer that the employees will have no doubt that their interests are constantly on the map. The president's representative is frequently among the plants, meeting his local men and conveying news and counsel for the benefit of the employees. The president annually makes a tour of all the plants for the sole purpose of meeting the elected representatives of the employees and the appointed management representatives, giving a frank account of his stewardship and taking them into his confidence on all pending issues and the prospects of the business. The spirit of such occasions is well illustrated by these recent remarks of President Grace at a gathering of employee representatives:

> "A square deal has been talked about tonight. If there is any so-called representative of the management of this company who is not fair and honest in his dealings with the employees and it is found out, he cannot work here any longer. If you men have anything on your mind and don't speak out, it is your own fault. There is no question that you cannot bring up, that you have not the right to discuss with us and expect a direct answer. If it is something you want and we cannot grant it, we will not hesitate to say so. If our decision is not convincing to you, you have the absolute right to convince us that we are wrong."

The Industrial Relations Department

Employees' representation in the Bethlehem Steel Corporation was not the beginning but the culmination

of its industrial relations department, also under the care of the assistant to the president. That had long been functioning and progressively expanding in service to the employees, not as a welfare measure chiefly, but simply as good morals and good business. In all employment functions, safety, health, sanitation, relief, pensions, employees' benefit association, housing, and many other matters it had already won a place in the esteem of the employees at every plant. The corporation's ideal, to make men while it makes things, is well illustrated in the remarks of President Grace commending this department to the employees and reminding them that their representation privilege was a natural and a permanent adjunct—the climax of good understanding:

> "We consider this plan of employees' representation permanently installed at all of our various plants. We consider our industrial relations department just as important as any we have. We regard it just as necessary as our manufacturing, purchasing, treasury and selling departments, and we are going to organize it just as completely, just as thoroughly and consider it just as much a part of our organization as any other which has been necessary in the past to round out a big industry like our own. What we are going to have is a Bethlehem shop in which any man regardless of affiliation can work under the very best conditions possible. These conditions and our success we will jointly work out. We are all employees . . . there is no difference whatever except that I have to do one part of the work while you men have your individual tasks in the shops and mills, but my work is not any more important than yours and I regard myself just as much an employee as you men."

How the Plan Functions

The diagram on page 1690 shows the course of any single issue which goes through all the possible steps. This is a rare occurrence. In five years not a single case has called for arbitration and only one out of nearly 2400, a purely personal issue, has gone beyond the general joint committee on appeals.

The company representatives are in daily contact by telephone and through meetings with the president's representative, in addition to which they render a weekly report giving a complete history of all questions that have arisen at the numerous plants during the week and a statement as to their final settlement. It was very interesting to see how this worked out. In many cases where the plants locally had apparently effected a justifiable settlement of the case, the president's office, on review and more study of the situation, would suggest a further consideration of the case at the plant.

The President's Participation

To the layman, the fact that use had not been made of the provisions of the plan for the reference of cases beyond the plant to President Grace, or of the arbitration feature of the plan, might indicate that the president was not brought into close contact with the adjustment work. It is enlightening to know that through his representative he and all the operating officials are kept advised of all important matters that arise at the plants which are of interest to the employees. Oftentimes the settlement is effected at the local plant upon the president's advice. In the office of the president's representative is to be found a complete record of all of the questions that have been taken up by the employees' representatives in the various plants and their settlement. These cases in five years number 2365 and have to do with every conceivable matter that is of vital interest to the employees. In addition, many more cases were adjusted between the individual employee representative and the plant authorities without becoming a matter of formal record.

Issues Raised by Employees

Some idea has been conveyed of the intangible effects of a plan which places trust in and responsibility upon the worker. What has the Bethlehem employee done with his democratic privileges during the five years of their existence?

There is a popular impression diligently fostered by opponents of any coming together in the plant that through a system of this kind the workers' representatives do not have the authority to discuss the *vital* questions affecting their employment. Nevertheless the Bethlehem records indicate that the great majority of cases brought up and settled have dealt with hours of work, rates of wages, methods of pay, and in many instances methods of operation. Not only so, but discussions regarding the future are freely indulged in by the employee representatives, not excepting the difficult but desirable abolition of the long working day in parts of the steel-making process. No topic concerning the worker's interest is "taboo," nor are the management representatives backward in stating their position on any subject raised and in inviting employee comment.

Distribution of Cases

The following analysis of cases handled to date is confined to the four original Bethlehem plants—Bethlehem, Steelton, Lebanon and Maryland—where there has been four to five years' experience with the plan. The statement is typical, however, of the briefer experiences at the more recently acquired Lackawanna and Midvale steel plants and at the shipyards and other Bethlehem subsidiary industries. The grouped topics correspond to the names of the various employee representatives' committees which handled them in the first instance. The joint committees, which may have to function later on some of the cases, are similarly named:

Six hundred and twelve (612) cases, or more than one-fourth, were directly concerned with employment and working conditions; 570 cases, or nearly another fourth, dealt with wages, piecework, bonus and tonnage schedules. Thus exactly one-half of the 2365 cases arising in five years pertained solely to the workers' direct economic interests, showing the very practical character of the plan and confuting theorists and others who claim that in the nature of things the employee's essential interests will be neglected by repre-

Classification of Cases Adjusted Under the Bethlehem Plan, and the Disposition Made of Them

Cases	Number
Employment and Working Conditions	612
Wages, Piece Work, Bonus and Tonnage Schedules	570
Safety and Prevention of Accidents	298
Practice, Methods and Economy	298
Health and Works Sanitation	184
Employees' Transportation	162
Pensions and Relief	122
Housing, Domestic Economies and Living Conditions	50
Education and Publications	22
Athletics and Recreation	12
Rules, Ways and Means	35
Total	2,365

Disposition of Cases

Settled in the affirmative*	1,682
Settled in the negative	330
Withdrawn by employees	103
Compromised	201
Pending settlement	49
Total	2,365

*In favor of employees.

sentatives within the plant or stifled by management influence. As a matter of fact, nowhere did the writer find the slightest hesitancy on the part of any Bethlehem employee or representative to "talk right out."

The other half of the cases settled are accounted for as follows: Safety and accident, 298 cases, technical methods and economy, 298 cases, together furnish another fourth of the settlements. Thus three-fourths of all the cases raised went right to the things which were most on the workers' minds, and these included justifiable criticism and helpful suggestions about continuity of employment and about the efficiency of plant practice and equipment. The remaining fourth of the Bethlehem cases was concerned chiefly with health, sanitation, transportation, pensions and relief, which furnished 468 cases, though, as already stated, these matters are admirably cared for by the company through established divisions of its industrial relations department. The 119 cases completing the last one-fourth of the issues raised were on matters less closely related to the "job," such as housing, education, recreation, and ways and means, on all of which employee opinion and participation have been most helpful.

Future Citizens of the United States Recently Graduated from Company Naturalization School

Nature of the Decisions Handed Down

The nature of the adjustments effected is interesting. Of the 2365 cases which actually reached the employees' representatives in committee and in some instances reached joint committees as well, 1682, or 71 per cent, were settled in favor of the employee. In the old days—and in not a few plants even today—an executive decision which had already denied such claims would rarely have been challenged, partly for lack of machinery of appeal but chiefly through genuine fear of the consequences to the employee. The above is a striking illustration of the fact that after all "the world do move."

Three hundred and thirty (330) cases raised by employees, or 14 per cent of the total, were settled in the negative, most of them in the first stage by the employee representatives' own committees, without the complainer or suggestor availing himself of the ample appeal provisions of the plan.

The "justice" of his fellow workmen was satisfactory in most of the cases to the employee concerned.

Two hundred and one (201) cases—8.5 per cent—after all the facts were brought out, were withdrawn by the employees concerned; 103—about 4 per cent—were compromised, and only 49 at this date are pending settlement in four large plants using the plan, thereby indicating the prompt service which it furnishes.

Some Sidelights

As this survey is as much an interpretation as a description in aid of those pragmatic employers, employees and the public who ask concerning the Bethlehem plan, "What is it for?" and "Does it work?" the writer devotes some space to certain characteristics of its working which are common to all plans and should be intelligently anticipated.

The natural history of any good plan of representation acceptable on the face of it to the great majority of the employees of a plant is as follows: At first there is a preponderance of cases of the personal and small-group grievance type; and the better the plan and the more unrestrained and democratic the approach provided, the greater will be the apparent dissatisfaction.

Employees and executives must keep their heads and allow the pent-up feelings of employees full expression under the new liberties accorded by the plan. Such feeling on the part of some employees may be due to traditional prejudices in the plant or in the industry, to "old, far-off, unhappy things"; or it may be due to recent abuses, personal or group dissatisfactions, both reasonable and unreasonable, unpleasant experiences with indifferent or reactionary supervisors, and perhaps most of all to ignorance or untruth regarding our industrial system.

That, of course, has long passed in the Bethlehem Steel Corporation; but it is an experience which all plans have to encounter and survive. It should be anticipated and frankly met and lived down. In doing so some "hard-boiled" reputations, if not their owners as well, may have to disappear; but that is all in the day's work, when you invite your employees to help you by managing as far as possible their own interests.

The one happy thought about it is that, after the first taking the lid off, "it can never happen again." The pot ceases to boil for good.

Previous good industrial relations and humane and considerate employment practice such as Bethlehem possessed do much to smooth the way for the introduction of good employee representation.

Nor is the evolution entirely on the employees' side. The employer himself, however sincere and convinced, is constantly being surprised at the extent to which his own executives of all ranks and his personal representatives under the plan have to get rid of their preconceptions — sometimes absurdly grotesque — about what the worker wants, how the worker feels, and the "cussedness" of his intentions in general.

Social Values in Representation

But when manifest abuses are once out of the way and both sides lay past all personal feeling and preconceptions, and diligently seek for, accumulate and grapple with the *facts*, the scene is changed.

Gradually both sides begin to appreciate and to use the factors of *right persuasion*. The desire on the part of anyone "to put something over" disappears, and worker and employer have the deep satisfaction of considering together and jointly settling things solely upon their merits. Sentimentalism and greedy opportunities disappear together, and in the Bethlehem steel plants the writer found a close approach by the workers and their representatives to a real *noblesse oblige*—a sense of uncovenated obligation to be fairer and squarer than "the other fellow."

Employee representation is true education, a "drawing-out" of unused faculties, and nowhere is "learning by doing" so effectually accomplished for the working man, for we never really *know* anything which we cannot *do*. Such a process proceeding increasingly at the daily job, with adults 25 to 65 years of age and long past the formal stages of education, is a public service, and one of the most hopeful things for the social welfare of the United States and the self-governing abilities of its inhabitants. That it should come through industry to thousands of sterling citizens, who, so far as our bewildering press is concerned often "cannot see the woods for the trees," is a testimony to the place that science, the systematized truth about *everything*—organized common sense—is taking in "the day's work." In such an atmosphere the militant doctrine of "the oppressors and the oppressed" cannot live, because "there aint no such animal."

Some Interesting Examples

Not only does representation turn employees and employer to "right persuasion," but this is followed by action, by a disposition to formulate principles and to follow them instead of merely arriving at favorable but unrelated verdicts. Gradually, as in safety work, prevention becomes the reigning idea, not cure, and it spreads among the elected representatives and their voters with interesting consequences. Only a few examples out of hundreds can be given.

In one Bethlehem plant it was not the foreman but the employee representatives who asked that the pattern-shop apprentices be given instruction in mechanical drawing and elementary mechanics in the plant to improve their efficiency, and the management promptly appointed an instructor.

In another plant of the corporation the writer found that the employees in the iron foundry drew up a list of unsafe practices there, with suggestions, and presented it to the management through their elected representatives. It was found the existing equipment was unsuitable and new plant was immediately installed. In other Bethlehem plants the writer found that employees had concentrated upon economy measures, with good suggestions on eliminating waste in cutting stock; on better methods of storing materials; on relocation of stairways interfering with operations. Still others drew attention to more convenient locker-room arrangements, wash basins, sanitary measures, weather shelters and better lighting on the job.

Others criticized constructively the paying-off methods and the efficiency of time-recording and checking. Working crews were increased by proof that existing practice on some jobs was not fair or economical. It was employees who asked for a shelter over a clay-bed to keep it from freezing. Pay-shortages, dismissals, transportation delays and a multitude of "mysteries" have yielded to steady presentation of "more facts" by privileged employees and the errors of the latter cleared up in committee.

Lessons for the Steel Industry

All who know the American workman through years of contact with him are well aware that his desires do not take the form which many who merely theorize about him have prescribed. What does successful employee representation in the Bethlehem Steel Corporation and other industries reveal? First, that the worker is initially strictly self-regarding in his desires; that he is little interested in any form of long-deferred reward; that profit-sharing is little in his mind and loss-sharing not at all; that he has no wish to share the burdens of administration and only occasionally has the capacity, but that he is entirely competent to discuss his own economic relationships.

Five things are first in his mind, and all progress in broadening his conception of industry and his intelligent cooperation in it depends upon these primary satisfactions. They are, in the order of their importance: A steady job; adequate real wages; a good supervisor; an individual and collective voice about all of his conditions; and a chance to rise on his merits. Where he can be vocal about these within his plant, without discrimination, without espionage, and apart from any external affiliations, it is found that regardless of nationality, religion, language or politics, he plays in loyally with his fellow workmen. The craft jealousies so diligently fostered outside gradually disappear in a real brotherhood in which the common laborer at last comes into his own.

A Union Chairman's Testimony

The writer found one group of employee representatives in a Bethlehem Steel Corporation plant presided over by a worker high in the councils of one of the oldest and most successful unions in the country. He had been chosen unanimously by his fellow workers —8000 of them—through their representatives to be their chairman. He told the writer that he had been astonished at the things that are on the minds of the workers, which the rules and practices of no union, not even his own finely organized one, could satisfy. He said that his chairmanship was a liberal education in the true inwardness of business, its risks and adventure, its penalties and its meager rewards, which could never have been acquired in any other way.

What About the Future?

This employee chairman was typical of numerous others with and without outside affiliations who testified to the same experience. As such employees successively function as representatives and "pass the chair," the plant acquires a growing fund of good will and understanding which no difference of opinion on any one issue can dissolve. "No discrimination" is not a mere phrase at Bethlehem. It is a fact, and the union man who can bring into the employees' councils light and leading is welcomed by them.

In concluding this survey the writer, who has had

a wide experience in industrial relations, would stress the following considerations for employers and executives in the steel industry:

Unionism has done much for the worker. It will always be on the heels of the employer who is illiberal or repressive about labor's economic status. No amount of generosity in other directions will compensate: it may even irritate. Labor has a solidarity transcending the plant. Though often exploited by its own leaders, it has honestly sought to make its own mistakes, and will continue to do so. It is seeking status and if it attains solidarity within the plant, as narrow self-centered unionism has not done and never can do, the occasional manifestations of that solidarity from enlightened workers need worry no one.

President Grace does not claim, nor do employers similarly situated, that the ultimate form of employee cooperation has been reached. What has been proved in five years at Bethlehem's plants is that it is not intelligence which has to be feared, but ignorance and isolation; ignorance everywhere—in high positions and in the lowliest, about the facts of life, of the day's job and of the feelings and fancies of "the other fellow." To understand is to sympathize and then to act intelligently without paternalism or condescension in providing a mutually self-respecting basis of cooperation. What that basis will be ten years from now no one can predict. What it might be today is abundantly manifested. It is capitalism's move and Bethlehem has shown the way.

Paint Test Fence at Oakland

The Paraffine Companies, Inc., maintained at Oakland, Cal., a test fence for testing paint which is exposed to the sea fog, salt air and other weather conditions prevailing in the San Francisco Bay region. It is placed so near the ocean that when the weather is rough the salt water spray dashes upon the fence, giving a severe exposure particularly for paint designed for protecting iron and steel against corrosion.

Panels of Metal, Wood and Glass Painted with Various Kinds of Paint and Exposed to the Action of Fog, Salt Air and Salt Spray, to Determine Corrosion-Resisting Qualities

The test fence consists of wooden slats between which the panels bearing the paint samples are placed. The panels are made of metal, wood and glass. Each panel is numbered, which corresponds to a similar number in a record book, which shows when the panels were placed in the fence and showing the condition at various times.

At each annual convention the salesmen review the results of the test fence. It gives the salesmen absolute confidence in the product which they are selling. Certain samples can be made and exposed on the fence under conditions known to the technical department and then sent out to salesmen for use in the field.

Test fences also are maintained in the San Joaquin Valley and several foreign countries. Tests can be carried out at Oakland in about one-third the time required in the San Joaquin Valley, because of the severity of the exposure at Oakland and in spite of the very hot weather in the valley during the summer time.

The daily melt at the Saco-Lowell Shops, Lowell, Mass., foundry has been increased from 20 to 60 tons. Several weeks ago molders were called out on strike. Since then non-union men have been employed.

Supreme Court Decides West Virginia Natural Gas Case

WASHINGTON, June 12.—Iron and steel plants in Ohio and Pennsylvania using gas from West Virginia fields will continue to receive supplies of this fuel. The Supreme Court yesterday upheld the States of Ohio and Pennsylvania in their effort to enjoin West Virginia from regulating the flow of its natural gas across State lines. The majority opinion of the court held that a State cannot prohibit or restrict the exportation of its natural products in interstate commerce. Dissenting opinions were rendered by Justices Holmes, McReynolds and Brandeis.

Under the title "A Quarter Century of Cumulative Biography" the H. W. Wilson Co. has put out an attractive 44-page booklet dealing with its activities and presenting its history from its inception in the University of Minnesota in 1898. The organization now occupies a five-story building at University Avenue and 162nd Street, New York, all being devoted to the service rendered by the company in indexing, cataloging and briefly reviewing books published in the United States. With an organization built up through the 25 years, several of the members of which have been continuously engaged in the work for upwards of 10 years, the different departments are carried on by the regular routine found necessary through the handling of so much material as passes through the office month by month. In addition to compiling indexes and bibliographies, the company publishes these indexes and reference works of this same character.

MAY STEEL OUTPUT

Largest Month's Total on Record — Daily Rate Less Than April—Year's Rate About 48,500,000 Tons

For the first time in the history of the steel industry the ingot steel production last month exceeded 4,000,000 gross tons. The daily rate in May, however, was less than that in April, because of the larger number of working days.

The May ingot output for the 30 companies reporting to the American Iron and Steel Institute was 3,537,753 tons or 131,027 tons per day for the 27 days as compared with 3,321,278 tons or 132,851 tons per day for the 25 days in April. This is a decrease of 1824 tons per day.

On the basis that the 30 companies reporting made 84.13 per cent of the total output in 1922, the country's production of ingots in May was about 4,205,100 tons or 155,700 tons per day. In April the total was about 3,947,800 tons or 157,900 tons per day. This would mean that the May production was at the rate of about 48,436,000 tons per year.

The statistics of the American Iron and Steel Institute since January, 1921, follow in gross tons:

Monthly Production of Steel Ingots by 30 Companies Which Produced About 84.13 Per Cent of the Steel Ingot Production in 1922

Months	Open-Hearth	Bessemer	All Other	Total
January, 1921....	1,591,281	608,276	3,629	2,203,186
February	1,295,863	450,818	2,796	1,749,477
March	1,175,591	392,983	2,404	1,570,978
April	1,000,053	211,755	2,150	1,213,958
May	1,047,810	216,497	1,543	1,265,850
June	808,286	193,644	1,476	1,003,406
July	689,489	113,312	575	803,376
August	915,334	221,116	1,621	1,138,071
September	908,381	265,152	1,207	1,174,740
October	1,269,945	345,837	1,028	1,616,810
November	1,294,371	363,912	1,718	1,660,001
December	1,129,174	296,380	1,539	1,427,093
Total, whole yr.	13,125,578	3,679,682	21,686	16,826,946
January, 1922....	1,260,809	331,851	822	1,593,482
February	1,395,835	348,571	616	1,745,022
March	1,918,570	451,386	795	2,370,751
April	1,997,465	445,939	1,109	2,444,513
May	2,214,774	494,893	1,474	2,711,141
June	2,143,708	487,851	2,918	2,634,477
July	2,020,572	464,047	2,485	2,487,104
August	1,807,310	404,379	2,893	2,214,582
September	1,911,147	460,127	2,505	2,373,779
October	2,352,207	518,010	2,198	2,872,415
November	2,360,903	525,945	2,449	2,889,297
December	2,241,104	536,214	2,572	2,779,890
Total, whole yr.	23,624,404	5,469,213	22,836	29,116,453
January, 1923....	2,571,491	677,486	2,717	3,251,694
February	2,290,418	625,838	2,761	2,919,017
March	2,656,134	742,564	3,309	3,402,007
April	2,594,706	722,719	3,853	3,321,278
May	2,744,201	788,350	5,202	3,537,753
Total, 5 mos...	12,856,950	3,556,957	17,842	16,431,749

Will Prepare Handbook of Government Specifications

WASHINGTON, June 12.—Meeting yesterday with Secretary Hoover, representatives of approximately 15 business organizations pledged their support to the Department of Commerce in getting out a "handbook" covering specifications and standards of the 2500 to 5000 kinds of commodities purchased by the Government. Mr. Hoover emphasized the fact that the specifications and standards being prepared are to cover Government purchases only, but said that ultimately it is expected that they will govern buying for States, municipalities and public institutions. He also made it plain that the department is not imposing specifications or standards of any kind on private business.

The work of preparing the specifications is in charge of the Federal Specifications Board and will bring about standards for Government purchases of all commodities, including iron and steel. Among those participating in the meeting were representatives of the American Engineering Standards Committee, the Society for Testing Materials, the Society of Automotive Engineers, the National Association of Manufacturers, the American Electrical Railway Association, the National Association of Purchasing Agents, the Association for Government Service and the American Hotel Association.

Lathe Break-Down Tests of Some Modern High-Speed Tool Steels

Comparisons of performance of modern high-speed tool steels in "lathe break-down tests" is the subject of Technologic Paper No. 228 of the Bureau of Standards. The work described dealt not only with tests in which the endurance of tools is measured under definite working conditions, but likewise with the limitations of this method of testing when applied to the purchase of steel.

The modern steels are first classified according to chemical composition and this division is made use of in discussing the results obtained. Important features developed may be summarized as follows:

Break-down tests are not satisfactory as the basis of purchase for tool steels.

While competitive comparisons of brands of nearly similar performance are not justified, owing to the qualitative nature of this type of test, relatively large differences may be ascertained with certainty, provided sufficient tools are tested and averages of at least two grinds are used in interpreting the results.

In certain severe break-down tests with roughing tools on 3 per cent nickel steel forgings in which high frictional temperatures were developed it was found that the performance of commercial low tungsten-high vanadium and cobalt steels was superior to that of the high tungsten-low vanadium type, as well as special steels containing about ¼ per cent uranium or ¾ per cent molybdenum. The average power consumption in all cases was practically the same, so that this factor need not be introduced in comparisons which may be made on the basis of the endurance of the tools.

Modification of test conditions, including small changes in tool angles but principally changes in the cutting speed, more markedly affected the performance of steels containing cobalt or special elements, such as uranium or molybdenum, than the basic types, such as plain chromium-tungsten-vanadium steels.

The relatively poor endurance of high tungsten steels under severe working conditions was not observed in more moderate tests which were made on the same test log with equal cutting speed and depth of cut, but with reduced speed and in which the frictional temperatures produced were not so high. Also, in these latter tests the performance of the cobalt steels was better than either the low or high-tungsten steels.

Hardness determinations and examinations of fractures indicate that the various types of commercial high-speed steel show differences in behavior under heat treatment and in physical properties which probably are of importance under moderate working conditions and might counterbalance slight advantages in performance.

Prices of Mill Supplies

Figures prepared for the National Supply and Machinery Dealers' Association, 505 Arch Street, Philadelphia, show comparative price changes in 100 leading items handled by mill supply houses. They are based on actual purchase prices of one of the largest jobbers and cover a series of years. July, 1914, is taken as the base and the figures show the peak as compared with the base, together with the excess over the base of prices Jan. 1, July 15 and Oct. 1, 1921, Oct. 1, 1922, and April 1, 1923. The latest figure is 89 per cent above the base. On Oct. 1 last the average was 70 per cent up; the peak was 166 per cent above the base.

The list covers everything from anvils to three kinds of wrenches, running through bolts, files, nuts, pulleys, screws, taps and a great variety of other items, mainly of iron and steel. Included, however, are rope, wooden pulleys, packing, sash cord and a number of other similar items, as well as several materials made of brass or copper.

The April figures show only one item below the 1914 figures, this being hand reamers. Drills, both high-speed and carbon, are very close to the base figure, as also are taper pins. On the other hand, shaft couplings are 260 per cent above the base, while coach screws are 205 per cent up. On April 1, 57 articles were less than 100 per cent above the base and 43 articles were more than 100 per cent above the base.

German Industry Revives as Mark Declines

Prices Rise Rapidly—Large Corporations Accused of Excessive Scrap Buying as Shortage Grows—Court Decides on Compensation for Depreciation of Mark

(By Radiogram)

BERLIN, GERMANY, June 11.—Foundry iron No. 1 has been advanced by the Pig Iron Association to 1,619,000 m. per metric ton ($20.35 per gross ton, at 1.2375c. per 1000 m.) from 1,600,000 m. ($20.48 at 1.26c. exchange) last week, and 774,000 m. ($12.97 at 1.65c.) the previous week.

Ingots have been advanced by the Stahlbund to 1,847,000 m. ($23.22), from 1,445,000 m. ($18.50) last week, being now again above the price of foundry iron. Two weeks ago they were 1,271,000 m. ($21.30).

Steel bars are now quoted at 2,600,000 m. (1.46c. per lb.), compared with 2,034,000 m. (1.16c.) last week and 1,755,000 m. (1.31c.) two weeks ago.

Thin steel sheets have been advanced to 4,171,000 m. (2.34c. per lb.), from 3,265,000 m. (1.87c. per lb.) last week and 2,818,000 m. (2.11c. per lb.) two weeks ago.

BERLIN, May 28.—After a two-month lull the steel industry is again being influenced by the mark's depreciation. The price trend is now decidedly upward, and activity, except in the Ruhr, where special conditions prevail, is increasing in response to the renewed desire to transfer waning mark holdings into materials. The combined efforts of the government and the Reichsbank to stabilize the mark exchange seems to have definitely failed. The gold reserve has heavily fallen. On Jan. 31 the bank had a total reserve of 1,004,830,000 gold marks. The last weekly statement, May 15, shows a total of 841,910,000 marks. Of the decline of nearly 163 millions, 60 millions were sent to New York to meet Belgian treasury bills, and the remaining 103 millions was sacrificed in vain to support the exchange. The only result of this loss of one-tenth of the gold reserve has been a falling mark, and public disbelief in further attempts to stabilize.

The price indices for June 1 show a sharp rise. April, following two months of declining prices, showed a rise in the commodities index of the *Frankfurter Zeitung* from 6427 to 8237. This month all prices which are factors in the general price level have risen. Railroad freight rates increased 50 per cent on June 1 and passenger fares 100 per cent. Coal was raised May 16, standard Ruhr coal going from 114,117 to 143,510 marks per metric ton, and foundry coke from 175,871 marks to 220,570 marks. As reported by cable, both the Iron Industry Union and the Steel Syndicate have raised prices more than once. Pig iron was raised from May 15 to May 28, only two qualities being unchanged, as follows, per metric ton:

	New Price Marks	Former Price Marks
Hematite	804,000	744,000
Foundry iron, No. 1	774,000	714,000
Foundry iron, No. 3	771,000	711,000
Siegerland steel-iron	844,000	844,000
Spiegeleisen, 6 to 8 per cent Mn.	935,000	935,000

Steel Syndicate prices were last increased on May 25, as follows, per metric ton:

	New Price Marks	Former Price Marks
Ingots	1,271,000	965,000
Blooms	1,422,000	1,080,000
Billets	1,513,000	1,149,000
Slabs	1,559,000	1,184,000
Structural forms	1,761,000	1,337,000
Bars	1,755,000	1,348,000
Hoops	1,251,000	1,633,000
Wire rods	1,893,000	1,437,000
Sheets, 5 mm. and heavier	2,001,000	1,519,000
3 to 5 mm.	2,247,000	1,706,000
1 to 3 mm.	2,589,000	1,966,000
Less than 1 mm.	2,818,000	2,140,000

Conditions in the Ruhr smelting and rolling mills were until the last few days little changed, the corporations continuing to work mainly for stock with borrowed money. In unoccupied Germany, business is dull, but there have been signs of renewed activity under influence of the currency depreciation. At the close of April 6.49 per cent of the members of the Metal Labor Unions Association were without work, and 24.74 per cent were working on part time. The part time work declined to 21.1 per cent on May 5, and has since probably fallen further. Conditions in the shipbuilding, machine-tool and farm-machine branches are not good; and a great deal of production is for stock. The Iron and Steel Wares Industries Association complains that the mark stabilization policy of February-April "almost paralyzed buying." The Hagen district finished-goods branch reports an improvement since the decline of the mark. The Solingen producers complain that French occupation policy makes selling difficult, the isolation of the British bridgehead being particularly felt. A month ago Solingen, Remscheid and Schmalkalden producers of steel products and small finished goods declared that prices had nearly reached and in some instances exceeded world-market levels; but the new mark decline has remedied this situation. The Cabinet nevertheless has proceeded with its policy of export aid which was found necessary during the stabilization period. Its new regulations abolish export licenses for a long list of goods. Instead of applying for a license first, the exporter need only report his transaction and give proof that he invoiced in a high-exchange currency and delivered 40 per cent of his high-currency receipts to the Reichsbank. In addition the export duties on certain goods have been reduced to from 1 to 3 per cent or abolished entirely. This policy of export aid was decided on two months ago, but because of the subsequent mark fall it is no longer necessary, German prices for finished metal goods being estimated, with the exchange 55,000 marks to the dollar, at only 54 per cent of American prices.

The coal and ore supply has so far been sufficient; but the Ruhr producers continue to use up old stocks of ore. In March, the latest available figures, 3,700,000 tons of foreign coal was imported, compared with 2,000,000 tons in February and 1,300,000 tons in January. That acute coal shortage is not expected is indicated by the cessation of orders for Czech coal. Hugo Stinnes has even contracted to deliver 1,000,000 gold rubles worth of coal to Russia on credit. A shortage of scrap iron is reported. The Socialist press charges the big smelting corporations with buying up scrap far in excess of their needs, using Reichsbank credit for payment, knowing that while the scrap will increase in value the credits will be repaid in marks of decreasing value. On the relations of debts to currency depreciation the Federal Appeal Court of Leipzig has rendered decision that persons who delay payment of mark debts must compensate the creditor for loss suffered through the mark depreciation during the term of delay. This measure is considered as one more blow at the validity of the Reichsmark.

Westinghouse Electric & Mfg. Co. has created a new engineering division to be known as the porcelain insulator and transmission engineering department and C. L. Fortescue has been appointed manager. Mr. Fortescue has been engaged in insulation and transmission work for more than 20 years. Entering the employ of the Westinghouse company in 1898, upon his graduation from Queen's University, Kingston, Ont., has was engaged in various capacities until 1902, when he started work on transformer designs.

Walter-Wallingford & Co., Cincinnati, have been appointed Western sales agents for Chateaugay low phosphorus pig iron.

MORE WORKERS AND HIGHER PAY

Increasing Employment and Average Wages in Identical Metal Working Shops

WASHINGTON, May 21.—An increase of 0.5 per cent in the number of employees, of 1.4 per cent in the total amount paid in wages and of 0.9 per cent in the average weekly earnings was shown in April from unweighted figures of 43 industries combined, when compared with March, according to the Bureau of Labor Statistics, Department of Labor. The report on employment in April is based on 5651 representative establishments in 43 manufacturing industries, covering 2,139,053 employees, whose total earnings during one week amounted to $55,353,080. Identical establishments in March reported 2,128,816 employees and total payrolls of $54,573,958. Increases in the number of employees were shown in 19 of the 43 industries.

Figures for the principal metal working industries follow, with comparisons of April, 1923, with the preceding month and with the same month one year ago:

Periods	Number of Establishments	Number of Men	Week's Payroll	Average Pay Envelope
Iron and Steel				
March, 1923.....	182	217,936	$6,187,226	$28.39
April, 1923.....	182	218,591	6,029,046	27.58
April, 1922*.....	115	119,414	2,464,839	20.64
Automobiles				
March, 1923.....	168	242,884	8,157,775	33.59
April, 1923.....	168	253,418	8,585,745	33.88
April, 1922*.....	45	95,927	3,120,525	32.53
Car Building and Repairing				
March, 1923.....	150	112,754	3,236,896	28.71
April, 1923.....	150	111,097	3,227,687	29.05
April, 1922*.....	85	38,485	1,017,377	26.44
Foundry and Machine Shops				
March, 1923.....	390	138,284	3,916,940	28.32
April, 1923.....	390	140,871	4,128,940	29.31
April, 1922*.....	(not reported)			
Miscellaneous†				
March, 1923.....	310	163,371	4,276,607	26.18
April, 1923.....	310	164,718	4,387,165	26.64
April, 1922*.....	(not reported)			
Metal Workers (the five groups above)				
March, 1923.....	1,200	875,229	25,775,444	29.45
April, 1923.....	1,200	888,695	26,358,583	29.66
April, 1922*‡.....	245	253,826	6,602,741	26.02

*As present reports cover many more plants, the 1922 figures are of interest only as indicating changes in wage rates.

†Agricultural implements, electrical apparatus, hardware, steel shipbuilding and stoves.

‡Includes only iron and steel, automobiles and car shops.

Governmental Statistical Work

More than 400 pages are required by the United States Bureau of Efficiency to present a thorough and comprehensive survey of the statistical work now being performed by various branches of the Government. Some 44 different bureaus and offices are engaged in the collection and dissemination of statistical information, the treasury and interior departments leading, with eight offices in each. The report is submitted to Congress in response to acts of March 1, 1919, and Nov. 4, 1919, with the idea of giving that body information upon which might be based a program of consolidation, with the view of eliminating duplication of effort among different Government agencies.

Recommendations are made by the Bureau of Efficiency that all non-administrative statistics should be centralized so far as practicable within the Census Bureau, the name of which would then be changed to the Bureau of Federal Statistics, with enlarged scope, personnel and duties. A large number of other statistical divisions, operated by different Government departments and appertaining to them, would then be transferred to the new bureau and become a part of it. A large amount of detail is carried in the recommendations which are made altogether under 33 heads.

Nearly 350 pages of the book are taken up by descriptions of the statistical activities of the Government by organization units. The last 50 pages comprise indexes and guides for determining where statistical information of various sorts is compiled. The ends desired under the recommendations made include an improvement of the Government's statistical output, an abatement of the burden upon private establishments in furnishing information to federal agencies and an increased economy, to be achieved largely by concentration.

Facts and Figures of the Automobile Industry: 1923

Issued by the National Automobile Chamber of Commerce, 366 Madison Avenue, New York, a 96-page pamphlet, "Facts and Figures of the Automobile Industry: 1923," is devoted to the growth of the automobile industry and the production of cars and carries a large volume of statistics illustrating both features. Some of the leading items, in connection with production of automobiles and cars and the number at present in service in the United States, are covered in the table.

Some idea of a scope of the publication aside from the features already mentioned are shown by the fact that it deals with the raw materials used in the production of automobiles, the oil and gasoline industry, methods of promoting safe traffic, records for five years of car thefts, schools devoted to automobile topics, taxation and motor vehicle laws, exports, service stations, relation of automobiles to population, good roads, motor truck transportation, automobiles on the farm, etc.

United States Automobiles and Trucks

	Production	Registration	Net Gains	Exports
1910.....	187,000	468,497	157,300	15,807*
1915.....	892,618	2,445,664	734,325	63,958
1916.....	1,583,617	3,512,996	1,067,332	80,843
1917.....	1,868,949	5,104,321	1,591,325	80,235
1918.....	1,153,638	6,146,617	1,042,296	47,244
1919.....	1,974,016	7,530,105	1,383,488	82,730
1920.....	2,205,197	9,177,129	1,647,024	171,644
1921.....	1,661,550	10,464,005	1,286,876	38,094
1922.....	2,659,064	12,239,114	1,775,109	78,234

*Figure for 1911.

Historic Bessemer Plant Dismantled

WASHINGTON, June 12.—Passing of a landmark in the history of the British steel industry is revealed by the announcement of shareholders of Henry Bessemer & Co., Sheffield, of the dismantling of the Bessemer plant of the organization. These works, says a report received by the Department of Commerce from Consul William J. Grace, Sheffield, were established by Bessemer in 1856 in order to demonstrate the commercial value of his process.

"The local steel makers had refused to take it up," says the report. "It succeeded beyond all expectations. The Bessemer company was soon able to offer steel at about half the price asked by other makers. The latter then arranged to use the process under royalty. It is said that after 14 years the works were sold for 24 times the amount of the whole subscribed capital of the firm, on which, during the partnership, a sum equal to 57 times the gross capital had already been distributed in profits, so that, apart from the huge sums which the inventor received in royalties to use the patent, each of the five partners in the Bessemer company had, in 14 years, made 81 times the amount of his subscribed capital. The 'steel age' may be said to have been inaugurated with the establishment of these works. The process has now been practically superseded by the Siemens-Martins furnaces, and only the latter are now used at the Bessemer works."

More Power in Alabama

BIRMINGHAM, ALA., June 11.—The Alabama Power Co. has obtained Federal license to build dams on the Tallapoosa River and intends soon to start work on a chain of dams, the first to be at Cherokee Bluffs and to generate 105,000 hp. With this in and the Mitchell dam fully equipped, the company will have a total of 335,000 hydroelectric hp. besides 125,000 of auxiliary steam power outside of the leased plant at Muscle Shoals with 90,000 hp. of steam generation. All this power is available for mine, mill and factory in industrial Alabama.

Cost Accounting of Foundry Labor

Outline of Procedure and Some of the Blank Forms for the Small as Well as Large Foundry

BY F. C. EVERITT AND JOHNSON HEYWOOD*

MERELY to know the weekly fluctuations of the payroll gives the foundryman no adequate control of the large amount of money spent for labor. To exercise real control—that is, to get the most for his money—he must know how this labor is used, its amount in proportion to the production, its amount by departments and the relation of non-productive to productive labor. The labor costs must be so analyzed as to give the information needed without red tape and heavy clerical expense. The method must be simple yet elastic and accurate.

Foundry labor is either productive or non-productive. Productive labor is charged directly to the product. Non-productive labor serves production indirectly by aiding the productive employee and cannot be charged directly to the product. It therefore becomes a part of the expense of the department in which it is used and later finds its way to the cost of the castings produced.

The entire payroll at the close of the month is credited to accounts payable and debited to the payroll account. Since the productive labor goes directly to the product, the amount of this labor becomes a part of the cost of the goods in process of manufacture, and it is therefore credited to the payroll account and debited to the goods in process account.

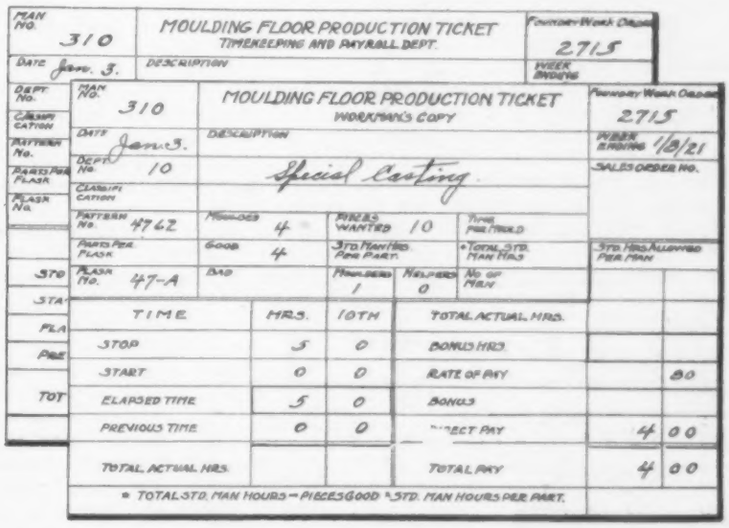
Since the non-productive labor is a part of the expense, it becomes a credit to the payroll account and a debit to the manufacturing expense account.

The payroll must now be distributed to the proper classifications in the various departments, for the money paid for the productive labor will have been on account of the melters, core makers, molders, cleaners, machinists, etc., while the non-productive wages have been for the firemen, engineer, general helpers, pattern men, flask men, clerks, etc. A portion of the labor may have been for work on new equipment or new buildings, in which case the amount so paid must be charged to the asset accounts.

To insure that the labor costs will be correct, the labor must be accounted for as used, so that the ledger accounts will reflect the manufacturing conditions. The correct way to record the labor is through the use of a time card or its equivalent. The time card (sometimes called a service card or work ticket) is in more general use than any other form. Its design will depend very much upon the conditions under which it is to be used. A single form in some instances may serve an entire plant, while in another foundry different forms may be required for each department. In any foundry two kinds of time cards are needed, one for productive labor and one for non-productive.

Form 25, the productive card, is made out in triplicate, one copy for the workman, one for time keeping and payroll and another for recording production and the collection of costs.

The time is best recorded in hours and tenths by a central control time stamp. The mechanical recording clock is preferred because of its accuracy, but the small plant can save by using a clock with a tenth-hour dial shown on Form 27. This dial can be made up in blueprint form and attached to the clock at a very small cost. To read time from the illustrated dial, the hour hand only is necessary, the minute hand being removed. In the illustration both hands are shown, the idea being to paint the minute hand white, leaving a black tip, thus serving as an aid in reading the regular time from the standard dial shown on the inner circle; but to read the elapsed time in hours and tenths the hour hand only should be used. The dial shows the starting time for the day at 7 o'clock, which is indicated as zero hour, the hour hand pointing to 2.2 hr. or 12 min. past 9. The one-hour lunch period shows at noon, five hours elapsed time, and at 1 o'clock the reading is still five hours elapsed time. This arrangement automatically eliminates the noon hour from the day's readings and the straight time can be recorded in hours and tenths without calculation.



MAN NO. 310 — MOULDING FLOOR PRODUCTION TICKET — TIMEKEEPING AND PAYROLL DEPT. — Foundry Work Order 2715

Date Jan. 3. — Description — Week Ending

MOULDING FLOOR PRODUCTION TICKET — WORKMAN'S COPY

Man No. 310 — Foundry Work Order 2715

Date Jan. 3. — Description — Week Ending 1/8/21

Dept. No. 10 — Special Casting. — Sales Order No.

Pattern No. 4762 — Moulds 4 — Pieces Wanted 10 — Time per Mould

Parts per Flask — Good 4 — Std. Man Hrs. per Part. — Total Std. Man Hrs. — Std. Hrs. Allowed per Man

Flask No. 47-A — Bad — Moulders 1 — Helpers 0 — No. of Men

TIME	HRS.	10TH			
STOP	5	0	TOTAL ACTUAL HRS.		
START	0	0	BONUS HRS.		
ELAPSED TIME	5	0	RATE OF PAY		80
PREVIOUS TIME	0	0	BONUS		
TOTAL ACTUAL HRS.			DIRECT PAY	4	00
			TOTAL PAY	4	00

* TOTAL STD. MAN HOURS = PIECES GOOD × STD. MAN HOURS PER PART.

The Production Card, Form 25, Is Made Out in Triplicate, One Copy for the Workman, One for Time Keeping and Pay Roll and Another for Recording Production and the Collection of Costs

Only two copies of the non-productive ticket, Form 26, are made out, since no ticket is required by the production department.

If a non-productive workman is on but one job during the day, but one set of these cards is required for that day and the finished card will be similar to the one shown. But if he is transferred during the day the cards should be changed when the transfer takes place, so that the kinds of work performed and the time on each job may be correctly recorded. This also holds true for the productive service card. If a molder works on one job the entire day, but one card is required. If he works on several jobs the time for each job must be recorded on separate cards.

It does not necessarily follow that exactly this method of accounting for time must be used in every foundry. In some foundries a change of time cards for every change of jobs on the mounting floor would cause a great waste of time and make necessary a large amount of clerical detail. The kind of time card to be used and the method of accounting for the time

*Of Miller, Franklin, Basset & Co., Inc., New York. In the issue of April 26, they gave an outline of the procedure in cost accounting for the material.

must be developed to fit the particular foundry in which the application is to be made. This description is merely to illustrate a method and show the importance of accounting for time correctly in order to secure accurate costs.

A foundry that handles a large variety of work may satisfactorily get the cost per pound of good castings by classification. In this case but one time card per producer per day is required; or the time may be accounted for through a labor report.

Another way is to account for the labor through a "take-up record" on which the castings made are recorded and the piece price figured into the molder's record of work done. The take-up record is used to excellent advantage in stove, boiler and heater foundries. A modified form of this record is especially good with standard production, such as radiator sections, where all the mounting is on a piecework basis.

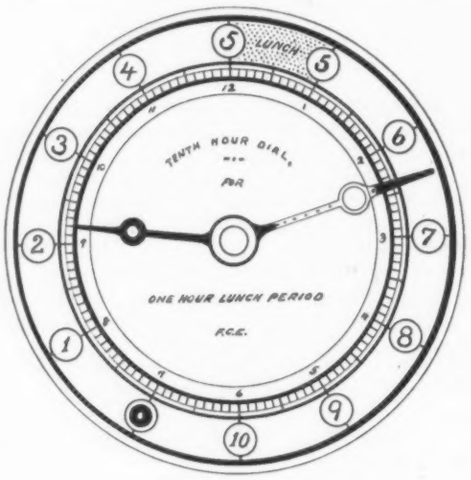
These latter methods, however, cannot be used in the machine shop, for the nature of the work is different and a different form of time ticket or service card is required. The non-productive card, Form 26, can be used in any department of the plant.

With a complete set of time cards reported for a workman showing his entire time for the day, whether productive or non-productive, a further check on his time is essential, which is made through the use of tickets from the in-and-out clocks. This checking serves also as a means of catching errors in the reporting of time. If the total time on the time tickets does not check with the clock cards, an investigation is at once called for and the correction made the next morning. These discrepancies should not be allowed to hang over until the last day in the pay period. They should be checked and corrected daily. It saves endless discussion and considerable time when making up the payroll at the end of the week or period.

When the time cards are finally checked they are ready to be entered into the payroll record through a form such as the payroll collection note, Form 28, which, as shown, covers a pay period of one week. If the pay period is two weeks or twice a month, an extension in the form for the required number of days is all that is necessary. On the upper illustration the time of man No. 250 is recorded from the non-productive tickets. This recording of time continues during the week and his total pay is figured on this sheet, which gives the record in detail for each workman for the whole pay period.

Similarly with the productive work, the time is recorded for workman No. 310 on the lower illustration, Form No. 28. The first record of time shows 5 hr. productive day work, and from a non-productive ticket, 5 hr. The recording has been continued during the week, showing the man's time for piece work, day work and non-productive time, all of which has been carried to the distribution column at the right of the form. The hours only have been distributed. This allows the extensions to be made at the end of the pay period with one calculation. In the distribution columns are totals giving a sum equal to the total of $42.80, which checks with the totals in the columns to the left.

This form gives a complete analysis of the workman's time for the entire pay period. It may be used as the permanent payroll record with the sheets filed by men number, in the order of calendar weeks, for ready reference. Whether or not it is used in that way, it is essential as a collection record for the time cards.



FORM NO. 27

Cover for Clock Face to Facilitate Calculation of Elapsed Working Time

Form 30 is a form of permanent payroll record which is in general use. The names of all employees are listed on the master sheet and the earnings posted from the payroll collection note. A slip sheet at the point A may be used for each pay period for a month or more before rewriting is necessary.

It is now necessary to collect the labor charges from the payroll collection note in order to make the necessary charges to the departments. The labor classification for each department of a typical foundry is here shown in detail.

DATE Jan. 3 — NON-PRODUCTIVE SERVICE CARD PAYROLL COPY — ORDER NO.

DEPT. 2 — EMPLOYEE NAME — CLOCK NO.

EXPENSE / TIME / STOP / START / ELAPS TIME / ISSUED BY

DATE Jan. 3 — NON-PRODUCTIVE SERVICE CARD MAN'S COPY — ORDER NO.

DEPT. 2 — EMPLOYEE NAME J. Smith — CLOCK NO. 250

EXPENSE DESIGNATION — CHARGE TO DEPT. 2

TIME	HRS.	TenHrs	DESCRIPTION OF WORK
STOP	10	0	Engineer Power Plant.
START	0	0	
ELAPS TIME	10	0	RATE .80 — AMT. 8.00

ISSUED BY

Two Copies of Non-Productive Labor Ticket, Form 26, Suffice, as None Is Required by Production Department

Classification of Non-productive and Productive Labor

Dept. No. — Department and Classification

1 Steam (Boiler)
- Firemen
- Maintenance labor
- Miscellaneous labor:
  - Coal handlers, sweepers, etc.

2 Power and Light
- Engineer and assistants
- Maintenance labor
- Miscellaneous labor:
  - Oilers, wipers, etc.

3 Tool and Maintenance
- Foremen
- Miscellaneous labor:
  - General helpers, oilers, sweepers, etc.
- Mechanics:
  - Millwrights
  - Plumbers
  - Electricians
  - Carpenters
  - Blacksmiths, etc.

4 Pattern Shops
- Foreman
- Miscellaneous labor:
  - Sweepers, etc.
- Pattern makers

5 General Office
- All executives
- All main office clerks
- All engineering

Dept. No. Department and Classification

6 General Factory
- General superintendent and assistant
- All general factory clerks, not including those clerks who may be charged direct to a department
- General planning and productive clerks
- Store room and receiving clerks
- Watchmen and painters
- General yard labor
- Truckmen
- All miscellaneous labor, such as may be used about the plant for general purposes

7 General Foundry
- Foundry superintendent
- General foreman
- Pattern storage help, for handling of active patterns
- Flask and equipment help
- Chemists—if used for foundry purposes only. If for general factory services, the chemists should be charged into Dept. 6, general factory
- Crane operators — depending upon the service rendered. If there are separate cranes for the various departments in the foundry, the crane operators should be charged direct
- Ladle daubers
- Miscellaneous labor:
  - All odd labor used generally about the foundry

8 Melting
- Any miscellaneous labor
- Unloading melting materials
- Breaking scrap and handling iron
- Handling slag and drop
- Direct melting labor

PAY ROLL RECORD

A

WEEK ENDING Jan. 5 1924

EMPLOYEES NO.	NAME	RATE PER	AMOUNTS DIRECT RW	DW	O.T.	INDIRECT O.W.	O.T.	TOTAL	BONUS RATE	BONUS AMT	TOTAL DAY	DEDUCTIONS DESCRIPTION	DEDUCTIONS AMT	NET PAY
	AMOUNT BRT FWD													
	Name													
	Name													
250	Name J. Smith	.50				50 00		50 00			50 00			50 00
	Name													
	Name													
	Name (Eng. Helper)					24 00		24 00			24 00			24 00
	Name													
	Name													
	Name (Foreman)					31 20		31 20			31 20			31 20
310	W. Johnson	.80	6 00	20 40		6 40		32 80			32 80			32 80
	AMOUNT RECEIVED													
	TOTAL													87 00

For the Permanent Payroll Record Form 30 Is Used

9 Core Room
- Foremen
- All miscellaneous help:
  - Unloading core sand
  - Wheeling and mixing
  - Loading and tending ovens
  - Handling cores
  - Inspection
- Direct—core makers

10 Molding
- Foremen and assistants
- Miscellaneous labor:
  - Preparing sand
  - Crane operators (if direct)
  - Drying molds
  - Closing and clamping molds
  - Pouring gang
  - Shaking out
  - Cleaning and sweeping, etc.
- Molders and direct helpers

11 Cleaning and Finishing
- Foremen
- Miscellaneous labor:
  - Inspection
  - Crane operators (if direct)
  - Handling castings
  - Taking out scrap and refuse
  - Cleaning and sweeping
  - Handling miscellaneous materials, etc.
- Direct cleaners and chippers

12 Annealing
- Foremen
- Miscellaneous labor:
  - Oven tenders
  - Handling castings
  - Sweepers, etc.
- Direct annealing labor

13 Machine Shop
- Foremen and assistants
- Miscellaneous labor:
  - Crane operators
  - General helpers:
    - Oilers, sweepers, etc.
    - Tool crib attendants
- Direct machinists

14 Packing and Shipping
- Foremen
- Shipping clerks
- Packing and shipping labor
- Cleaners and sweepers, etc.

15 Selling Expense
- Salaries, executives
- Salaries, clerical
- Salaries, salesmen

PAY ROLL COLLECTION NOTE

Rate .80 per hr. No. 250

Week ending Jan 5 1921 Dept. 2 Workman J. Smith (Engineer)

DATE	CLOCK CARD HOURS	SERV'CE CARD HOURS	O. T. HOURS ACTUAL HOURS	O. T. HOURS BONUS HOURS	DIRECT LABOR PIECE WORK HOURS	PIECE WORK AMT.	D. W. HOURS	INDIRECT HOURS	DISTRIBUTION DEPTS 2						TOTAL
S															
M	10	10						10	10						
T															
W															
T															
F															
S															
TOTAL HRS.															
TOTAL AMT.								30 00	50 00						50 00

WAGES EARNED — DETAIL OF DEDUCTIONS

				DESCRIPTION	AMOUNT	O. K.
TOTAL EARNED	50	00				
ADDITIONS			1			
TOTAL			2			
DEDUCTIONS (A)			3			
NET			4			
LESS ADVANCES			5			
NET PAY →	50	00		(A) TOTAL DEDUCTIONS		
O K'D BY						

PAY ROLL COLLECTION NOTE

Rate .80 per hr. No. 310

Week ending Jan 5 1921 Dept. 10 Workman W. Johnston, Moulder

DATE	CLOCK CARD HOURS	SERV'CE CARD HOURS	O. T. HOURS ACTUAL HOURS	O. T. HOURS BONUS HOURS	DIRECT LABOR PIECE WORK HOURS	PIECE WORK AMT.	D. W. HOURS	INDIRECT HOURS	DISTRIBUTION DEPTS 10	10	10 P.W.				TOTAL
S															
M	10	10					5	5	5	5					
T	10	10					10		10						
W	10	10			10	6.00					16.00				
T	10	10					10		10						
F	8	8					5	3	5	3					
S	8	8					8		8						
TOTAL HRS.	56				10		38	8	38	8	10				56
TOTAL AMT.						6.00	30 40	6 40	30 40	6 40	6.00				62 80

WAGES EARNED — DETAIL OF DEDUCTIONS

				DESCRIPTION	AMOUNT	O. K.
TOTAL EARNED	62	80				
ADDITIONS			1			
TOTAL			2			
DEDUCTIONS (A)			3			
NET			4			
LESS ADVANCES			5			
NET PAY →	62	80		(A) TOTAL DEDUCTIONS		
O K'D BY J.C.	✓					

Two Illustrations of the Use of Form 28 for Making Up Weekly Pay Roll

Such an outline can, of course, be only suggestive. The exact list must be made up to meet the conditions in the individual foundry.

To collect all labor in a form which will permit of ready proof and convenient posting to the expense analysis, the payroll analysis sheet, Form 31, is used. These data are gathered from the payroll collection notes and the statement made up from the office private payroll record. They are then entered weekly on the payroll analysis. The departments' labor and salary items are arranged on this form exactly as they will be found in the expense analysis. When the entries are completed the total of $3,830, for the week of Jan. 8, for instance, must check with the payroll for the week. At the end of the month the items are totaled across the page and proved with the sum of the weekly totals as a check against errors. The analysis also gives the amounts of indirect, direct and total payroll for the entire plant, as well as the salary list of the sales department.

PAY ROLL ANALYSIS — MONTH January 1921

	LABOR & SALARY CLASSIFICATION	WEEK ENDING 8	15	22	29	PAY ROLL INDIRECT	DIRECT	TOTAL	P.C. TO TOTAL
1	STEAM.-								
	Fireman	31 25	31 25	31 25	31 25	125 00		125 00	
	Maintenance Labor			4 00		4 00		4 00	
	Miscellaneous "	15 00	18 00	13 00	14 00	60 00		60 00	
2	POWER & LIGHT.-								
	Engineer	50 00	50 00	50 00	50 00	200 00		200 00	
	Maintenance Labor	8 00	13 00		10 00	31 00		31 00	
	Miscellaneous "	19 00	23 00	18 00	20 00	80 00		80 00	
3	TOOL & MAINTENANCE.-								
	Foreman	37 50	37 50	37 50		150 00		150 00	
	Non-Chargeable Labor								
	Miscellaneous "	10 00	14 00	11 00		45 00		45 00	
	Chargeable "	76 00	76 00			300 00		300 00	
4	PATTERN SHOP.- etc.								
5	GENERAL OFFICE.-								
	Salaries Executives	150 00	150 00			600 00		600 00	
	" Clerical	50 00	50 00			200 00		200 00	
	" Engineering	75 00	75 00			300 00		300 00	
6	GENERAL FACTORY.- etc.								
7	GENERAL FOUNDRY.- etc.								
8	MELTING.- etc.								
9	CORE ROOM.-								
	Foreman					100 00		100 00	
	Miscellaneous Labor					60 00		60 00	
	Core Makers						700 00	700 00	
10	MOULDING.- etc.								
11	CLEANING.-			etc.			etc.		
	TOTAL FACTORY PAY ROLL	583 00	625 00	587 00	525 00	6406 00	7530 00	13936 00	100%
15	SELLING EXPENSE.-								
	SALARIES EXECUTIVES							300 00	
	" SALESMEN							500 00	
	" CLERICAL							80 00	
	TOTAL							880 00	6%
								13,516 00	97%
	CHECKED	JC ✓	JC ✓	JC ✓	JC ✓	JC	TOTAL	14816 00	106%

For Convenient Posting to the Expense Analysis, Form 31, a Payroll Analysis Sheet Is Used

Observe that this anaysis of the payroll, in its simplest form, gives the ratios of any labor or salary item to the total as well as the proportion of manufacturing and selling payroll.

The time cards have now given all of the information required for payroll purposes. The necessary routine is to have all time cards reported each morning for immediate checking. Following the labor accounting for the payroll, the productive time cards may be filed by operation number, part number or order number, so that the labor costs may be readily totalled against the castings being made. The non-productive time cards are filed by departments and labor classification for use at the end of the pay period.

Apprenticeship Plan of Boston Branch, National Metal Trades Association

The final spring meeting of the Boston branch National Metal Trades Association, held Wednesday evening, June 6, at Youngs Hotel, Boston, was given over to a discussion of the many questions dealing with apprenticeship. C. M. Morrin, supervisor apprenticeship training, Brown & Sharpe Mfg. Co., Providence, R. I., and Dean Carl S. Ell, Northeastern College, Boston, were the guests of the evening.

Dean Ell's remarks were chiefly in connection with what the Northeastern College is doing in training young men to become engineers. This year, he said, 32 per cent of the students are engaged part time in work in metal trades industries. Dean Ell believes that automatic machinery is one of the chief causes of the scarcity of skilled mechanics today. Automatic machinery, he said, has reduced skilled mechanic requirements and has a tendency to discourage young men from taking up the craft. "The need of skill is still vital," he said, "but skilled requirements are drifting more and more into engineering channels."

Mr. Morrin, in a brief manner, told what the Brown & Sharpe Mfg. Co. is doing in an apprenticeship way. Clarence H. Wilson, secretary Boston branch, read a report of the apprenticeship committee which stated that a simple and uniform plan of apprenticeship has been completed. Printed forms of this plan will shortly be sent to members of the Boston branch. The plan is cooperative in nature and can be applied in the small as well as large shop, foundry or other production unit. It involves a permanent organization among the association membership to carry on educational work through parents, teachers, associations, news agencies and trade papers, and is one of the most constructive measures brought out in the metal trades in recent years, and important as well.

Resolutions on the death of Winslow Blanchard, Blanchard Machine Co., Cambridge, Mass., machine tools, were adopted. Mr. Blanchard held office in the Boston branch many years.

Following the example of steel companies which have been using the inland rivers for steel deliveries, the Kelly Axe Mfg. Co., Charleston, W. Va., has inaugurated its own service to haul steel from Pittsburgh mills. A motor towboat conveyed two barges to the terminal of the Jones & Laughlin Steel Corporation recently to be loaded with 700 tons of steel bars. The loaded barges will go to Huntington, W. Va., on the Ohio River and then to Charleston on the Kanawha River.

Use of Steel by the Automobile Industry*

Compilation of Statistics and Opinions of Manufacturers —Bad Effects of Deferred Buying—Present Policy Conservative

BY A. H. CHAMBERLAIN**

COMMENTS on the steel market during the past year have usually involved some remarks as to the demands from motor car and truck buyers and other manufacturers whose product is directly or indirectly related to the automotive industry. It is a noteworthy fact that large consumers of steel in automobile production are almost always in the market at the same time and, in a period of short supply, price with them is a secondary consideration. Their anxiety to protect themselves often leads to bidding up the market against each other with rather serious effects on jobbers and other buyers of merchant steel who must necessarily make forward commitments to prepare for the requirements of their general trade. I learn by inquiry that the National Automobile Chamber of Commerce is collecting some statistics as to all classes of material consumed in the automobile industry and I have just been favored with a copy of its report just issued, in which it attempts to estimate the percentage of the country's iron and steel capacity which the industry absorbs.

I have addressed a letter of inquiry to a large number of the leading steel mills and manufacturers of steel products consumed by the automobile trade, asking them to favor me with such definite or estimated figures to this purport and such comments as might be illuminating in considering the subject. I am indebted to our manufacturing friends for a large number of very interesting replies and, while I have agreed not to divulge the sources of my information, I have collected it for presentation to you in such a way as I think will be most interesting and suggestive. Perhaps the most comprehensive information and the most interesting suggestions have been received from high officials of the largest and most important mills. The general manager of sales of one of the most important factors producing sheets writes me in part as follows:

Buying Policy Criticized

The writer of this letter has for two years or more taken every opportunity of discussing with automotive executives with whom he comes in contact their methods of transacting business, and we have not hesitated to criticise in a friendly way their practice of confining their business, with respect at least to purchases to a period of six or seven months of the year. We have pointed out to them that no great manufacturing concern can transact business on a satisfactory basis without being well provided with stock. Whether this should be for a two, three or four months period depends upon the character of the business, and we believe the larger interest in the automotive industry will soon be forced to purchase sheets and other steel products in the fall of the year, giving specifications which may be executed during the winter months, in order to meet this insistent demand which usually starts in March and continues through August.

The automotive parts makers are evidently unable to protect themselves by purchases of sheets, bars or whatever item may be required until they have received final specifications from the automobile manufacturer and frequently these do not arrive until the eleventh hour, then the utmost effort is required to obtain prompt delivery, and offers of premiums for early shipments begin, and this leads to other practices which should be avoided.

A very few of our largest customers in the automotive industry are cooperating with us to the extent of giving us specifications early in the year, and these several interests have had a very satisfactory demonstration of the benefits accruing from such practice this year. It may never be possible to spread the business of the automotive industry over a twelve, or even a ten-months period, but if this cannot be accomplished, then we may expect these sudden fluctuations in markets in which they are interested.

Estimates as to the percentage of the country's steel consumed in the automotive industry do not vary so much as might be expected. One large mill says it has figures that it regards as authoritative indicating that, so far as sheets are concerned, the automotive industry is now absorbing about 35 per cent of the product.

The Iron Age Analysis

The sales manager of another large mill sends me the following analysis:

In January of this year THE IRON AGE published some statistics which I understand were compiled from reports made to it by the producers of 72 per cent of the total rolled steel output of the country. In this report THE IRON AGE showed that the total production of rolled steel in the year 1922 amounted to 24,600,000 gross tons, and that the automotive industry consumed 10 per cent of this total. In the same article it is stated that of the total production of rolled steel products, 19 per cent was bar steel and 11 per cent sheets.

Practically the total requirements of the automobile manufacturer, in the steel line, are sheets or bars, so that I think it is safe to assume that the 10 per cent which this industry used in 1922, or 2,460,000 gross tons, is composed of bar steel and sheets; so that the automotive industry therefore took 33 1/3 per cent of the total output of bars and sheets. Naturally, an industry that controls such a large percentage of these two commodities would have a very decided influence on the market. Many people seem to have gained the impression that the automobile manufacturer and the manufacturer of automobile accessories bid up prices, but this has never been our experience. The buyers in this line of trade are just as shrewd and drive just as hard a bargain as the steel jobbers. What they have demanded, however, is quality and in many instances they are willing to pay an extra price for the higher grades of steel that are necessary in the production of automobiles. The fact, however, that they do use such a tremendous tonnage, of course, has a very noticeable effect on the demand when the automobile industry is flourishing.

During the year 1922 a total of 2,577,000 passenger cars and trucks were produced in the United States, which is over 16 per cent greater than the best previous year's production, which was 1920. For the first three months of 1923 the total production of passenger cars and trucks, I understand, amounted to over 862,700, which is at the rate of approximately 3,500,000 for the year, or almost 50 per cent increase over last year. Many people claim that the automobile industry cannot continue throughout this year at the present rate of production and, assuming that this is true, nevertheless it appears to be a fact that the production of 1923 will be considerably in excess of last year, and the chances are that this industry will continue throughout this year to exert a very decided influence in the market, particularly for bar steel and sheets, which, of course, are the two products that the members of the American Iron, Steel and Heavy Hardware Association are most interested in.

Statistics show that in the year 1922 77½ per cent of the passenger cars produced were sold for less than $1,000 and 67 per cent of the trucks produced were light trucks of one ton or less capacity. This, in my mind, shows that the man of modest means and the wage earners are by far the largest buyers of automobiles, and the small merchant and the farmer are the largest buyers of trucks. Therefore, it is my opinion, so long as general business remains good, we may look for a heavy demand for automobiles. Just as soon as general business begins to slow down, the automobile industry will be one of the first to feel the effects of such a slackening in trade. As soon as the automobile industry slows down and the mills are forced to secure from other industries tonnage to take the place of that consumed by the

*Presented before convention of American Iron, Steel and Heavy Hardware Association at Chicago, May 15.
**Secretary American Iron, Steel and Heavy Hardware Association.

automobile manufacturer, there is bound to be a weakening in prices, regardless of the costs of production. I am firmly of the opinion, therefore, that the automobile industry is one of the barometers of trade, particularly so far as bar steel and sheets are concerned; and it is well to keep this in mind in determining when it is advisable for the jobber to add to and when to decrease his stocks of these two commodities."

Mr. Topping's Views

I am given permission to use the following interesting letter from John A. Topping, chairman of the Republic Iron & Steel Co.:

The figures presented by the trade papers are the result of collaborative efforts between the principal producers and said papers, and are, I think, reasonably accurate, although partly estimated.

I would suggest in this connection it would be extremely helpful, in arriving at a more accurate disposition of steel, if your organization were to keep an accurate tabulation of the disposition of steel from store.

In making up the figures recently the iron trade papers estimated the disposition of steel from store on the same percentage basis to the various consumers as the records showed by the movement direct from mill. In other words, if mill shipments to the automotive trade were 10 per cent, it is assumed that the store shipments would hold good in the same proportion.

As to the other point you raise, viz., what would be the effect upon the steel trade in general of any let-up in demand from the automotive trade, I would express the opinion, it would not have any material effect, because the total amount consumed being only 10 per cent, the reduction in total amount (even though the automotive trade was reduced to a 50 per cent operating basis) would be approximately 5 per cent.

As against possible reduction from the automotive trade, we look for materially increased consumption from the agricultural implement trade, and we do not expect to see any material change in the railroad requirements during this year; likewise, there is no indication of any let-up in the building trade.

Cold-Finished Material

The president of a mill which is one of the largest producers of cold-finished material writes me as follows:

If this year's production reaches 3,000,000 cars, the automobile industry will consume approximately 15 per cent of the total ingot production estimated at 40,000,000 tons, and as a tonnage factor will be next after the requirements of the railroads and building trades, both of which, during the past six months, have reached new high levels.

It is estimated that the automobile industry consumes about 60 per cent of the production of the cold-finished steel bar industry and from 35 to 50 per cent of the output of the cold-rolled strip steel industry. I am not informed as to its relation to the sheet industry, but it is very important. The extent to which this business has influenced the advancing steel market during the past six or eight months can, in my opinion, be measured only by its importance as a tonnage consumer. There is no question that it has had some influence, but only as values are affected by the law of supply and demand.

Another manufacturer of cold-drawn material writes:

From our own little viewpoint it seems that the automotive industry is taking about 70 per cent of the cold-drawn steel which we manufacture, but as we are a small institution, this may not be a conservative estimate of the market at large.

It would seem to us that the present rate of buying will continue during the rest of the year, and while it has been hinted that the automotive industry would suffer a depression during the third or fourth quarter, it seems that the demand for cars by the buying public is so high that it will run far beyond the pessimistic prophecy. Other industries are affected and it is starting the wheels of many factories that have been slowed down for some time.

The machine-tool industry appears to be getting active, and there are many branches of the machinery manufacturing trade indirectly connected with the automotive industry that form a very large circle in the metal-working industry of America.

Our local problems are to secure sufficient hot-rolled material to fill the orders we have booked and supply the trade that we are obligated to serve, and coupled with this is a scarcity of labor which, according to trade reports from other districts, does not affect them, but still it has come under my personal observation that Detroit is affected in a similar way, and it seems to me that we will continually be concerned with increased labor rates so long as the present condition exists. There has recently been a movement to stay the prices of scrap iron. This may, in a measure, prevent abnormal costs of iron and steel if it is recognized by all manufacturers, and I believe that it is the duty of all to keep away from extremely high prices, and cause what is known as a premium market, which is so dangerous to every industry and the country at large.

Buying of Bolts and Rivets

Going over lines which enter into automotive production I quote the following from an official of a large bolt and rivet manufacturer in the Middle West:

There is no question in my mind that on certain lines, such as small carriage and machine bolts, stove bolts, cap screws, screw stock, sheets, etc., the heavy buying of the automotive trade in the last year has had a decided effect on market conditions.

The purchases are still heavy, but after a very thorough investigation I find that the demand for the very high-priced cars is already slowing down, but, on the other hand, concerns like Chevrolet, Dodge, Ford and other makers of cheaper cars, with whom I have talked, claim there is no sign of any let-up in demand for their cars, and in fact, it seems to grow greater, and they expect to go through the entire year on the present basis. In fact, they are steadily increasing their schedule as fast as material requirements will allow.

The above suggests that continued large production of lower priced cars is one factor to be considered in its effect on steel tonnage, since, after all, the tonnage consumed in high priced cars is insignificant in view of the comparatively small number made and sold.

Tool Manufacturer's Observations

A leading tool manufacturer writes:

We do feel that motor vehicles have had a strong influence in the improved conditions of this past year. The industry itself has given employment to a vast number of people, and in addition to those directly employed, it has improved conditions that are related to the industry but not actually a part of it. The materials used in the manufacture of cars, the machinery, etc., necessary for manufacturing not only cars but the items used in making cars, form a long chain, and were it not for the employment thus created I am confident that conditions would have been much worse.

It would seem to the writer that this influence has about reached its peak, at least for the present. The natural heavy demand for automobiles will probably begin to lessen within a month or six weeks, owing to the advancing season, and thus may bring to some extent a curtailment in the heavy demand of the motor car manufacturer until plans are developed for the next year.

I do not mean that this is going to show a marked falling off immediately, but we rather expect that the demand from the automobile manufacturers may decrease slowly until fall, and then the improvement will have to depend upon conditions which will govern the production plans for the next season. It is our belief, however, that most automobile manufacturers are operating on as low an inventory as possible and therefore their purchases will diminish only as their business diminishes, and likewise will begin to increase as their new plans are made for new production. This, in our opinion, tends to establish a much more healthy condition than overbuying at any one time, followed by shutting off purchases completely.

Conservatism of Buyers

This estimate as to the conservatism of the buyers and the low inventories on which they are operating is confirmed by the following paragraph from the president of a drop forge company:

From what we can observe, both from actual inquiries and orders, also from conversation with the automobile officials, we find they are playing very close to the wind. We do not find any of them buying any further in advance than is absolutely necessary, and this, in our opinion, is a splendid condition because it would appear that the slump, which is bound to come sooner or later, is largely discounted, and in being discounted is that much further away. We know that stocks are low and, in our opinion, we should have splendid business for the rest of this year.

Further confirmation of the above is found in a portion of the following letter from a manufacturer of motor products:

We are of the opinion that, while the automotive industry does not consume a very large percentage of the steel ingot

capacity of this country, it is to a considerable extent responsible for some of the premiums which are now being paid for certain classes of steel which are made only for automotive purposes.

The fact that automobile manufacturers are buying only from month to month places the parts manufacturers in a position where they are compelled to ask the mills for special favors, placing tonnage on their schedule in advance of tonnage which has been on the books for a much longer period; therefore, a number of the mills are taking advantage of the situation, asking a permium for early rolling.

Data compiled by THE IRON AGE show that the ingot capacity of the United States is used as follows:

10 per cent for automotive industry.
22 per cent for railroads.
15 per cent for building and construction.
10 per cent for oil, gas, water and mining.
4 per cent for agriculture.
4 per cent for food containers.
7 per cent for exports.
28 per cent for all other purposes.

Finally, I have received letters from THE IRON AGE and the *Iron Trade Review* summarizing the statistics which they have gathered in regard to the steel consuming industries. These letters are too long to add to the present reading unless it is your pleasure that I should do so, but I will include them in the convention report and shall be glad to show them to anyone interested.

Committee to Investigate Storage of Coal, in Cooperation with Commission

Announcement of personnel and plans of the committee which is to direct a national investigation of the storage of coal in cooperation with the U. S. Coal Commission, the Department of Commerce and the Bureau of Mines is made by the Federated American Engineering Societies. The committee members are:

H. Foster Bain, Director of the U. S. Bureau of Mines, Washington; David Moffat Myers, former Fuel Administrator, New York; Perley F. Walker, dean of engineering, University of Kansas; W. H. Hoyt, chief engineer of the Duluth, Missabe and Northern Railway, Duluth, Minn.; S. W. Parr, professor of applied chemistry, University of Illinois; Edgar S. Nethercut, secretary of the Western Society of Engineers, Chicago; Roy V. Wright, editor *Railway Age*, New York. The chairman is W. L. Abbott, chief operating engineer of the Commonwealth Edison Co., Chicago.

This main committee, it was stated by Dean Mortimer E. Cooley of the University of Michigan, president of the Federated American Engineering Societies, will work with committees in every state, studying local conditions through local engineers in an effort to find a solution for the problems of coal consumers from the small households to the largest industries.

American Bridge Co. Will Dismantle Plant at Detroit

Due to adverse labor conditions in the Detroit district, the officials of the American Bridge Co. have decided to dismantle its Detroit plant. The company will maintain engineering offices in the city and operate as heretofore, but will discontinue all fabricating at that point and supply the district from its other plants.

Employment in industrial plants in Cleveland showed a gain in May following a slight falling off in April, according to the monthly report of the Cleveland Chamber of Commerce. The report shows that on May 31, 100 factories employing more than 500 persons had a total working force of 94,642, or a gain of 1.5 per cent over April 30, and a gain of 1025 over March 31. The number of employees in plants making iron and steel and their products increased 1.1 per cent and the number of employees in plants making automobiles and accessories increased 3.1 per cent.

Design of Furnaces for Burning Powdered Coal

Furnaces in which powdered coal is to burn must be large enough, and be correctly shaped, so that the coal may burn completely without impinging on the brickwork, and must be provided with facilities for removing the ash, states the Department of the Interior in Bulletin 217, just published by the Bureau of Mines. If the furnace is correctly designed, about 3 B.t.u. per second may be liberated per cubic foot of combustion space. This rate of combustion is sometimes exceeded, but if it is much exceeded the coal will not be burned completely.

In many furnaces the temperature is so high that the ash fuses and on settling in the furnace collects in a continuous mass. It has become expedient in some furnaces to cook the ash before settling and so prevent it from collecting in a continuous mass, though generally this is not done, and the ash collects either on the hearth, whence it is removed when the furnace shuts down, or it is removed as a liquid slag. The ash that does not settle in the furnace goes off with the gases, and care must be taken to see that it may not be deposited in the flues and so impede the draft.

When a furnace previously heated by coal burned on a grate, gas, or oil is to be transformed into a powdered-coal fired furnace, the furnace may or may not have to be modified in design to suit powdered coal. Except for boiler furnaces, very radical alteration of design is unusual. At most, the change consists usually in enlarging the furnace. But no furnace should be fired with powdered coal without the advice of experienced engineers, who will either approve the application of powdered coal to the furnace as it exists or carefully redesign it so that it may be economically operated with powdered coal, using the best means of disposing of the ash.

May Construction Largest on Record

Figures for building contracts compiled by F. W. Dodge Corporation show that during May, in the 36 eastern States, construction amounting to $433,906,000 was placed under contract, this covering about seven-eighths of the total construction of the country. The increase over April was 9 per cent; over May of last year the increase was nearly 5 per cent. The present month shows the highest figure for any month on record.

"Many observers," says the report, "have stated that the construction program this year is in excess of the capacity to build, and the situation has become acute in New York and other eastern centers."

Residential construction showed a slight decline, amounting to $168,216,000, or 39 per cent of the month's total. Public works and utilities accounted for $83,817,000; industrial plants for $62,979,000; business buildings for $59,510,000; educational buildings for $30,453,000.

Ore Imports Into United Kingdom

WASHINGTON, June 12.—Imports of all descriptions of ores into the United Kingdom during the first quarter of 1923 recorded increases over those for the corresponding period of 1922 and in some instances certain classes exceeded the aggregates for the first quarter of 1923, according to a report received by the Department of Commerce from the American Consulate General, London. Manganiferous ore imports rose sharply to a total of 34,630 tons, compared with 9,498 tons in 1922, as compared with 40,093 tons for the same period in 1921. Other kinds of ore except chrome ore and pyrites totaled 1,400,750 tons as compared with 631,497 tons one year ago, and 1,070,585 tons in 1921. Compared with the period in 1922, imports from Spain more than doubled. Manganese ore imports for the first quarter of 1923 amounted to 89,547 tons, as compared with 21,831 tons for the corresponding period in 1922 and 104,492 tons for the corresponding period in 1921.

New Heavy Duty Roller Bearing

Floating Axes of the Rolls Designed to Carry the Heavy Mold in a Centrifugal Casting Machine—Applicable to Other Machinery

BY L. CAMMEN

IN roller bearings it is necessary to provide means for maintaining the rollers in parallel alinement and in properly spaced relation to each other. This is usually accomplished by the use of spacing rings and similar devices.

This does not constitute much of a problem in small bearings where the loads carried are supposed to be comparatively light. In such a case extreme accuracy is not required and a loose fit is allowed in the making of these spacing rings, so that once in a while there is no more than a line contact between the roller and the spacing ring.

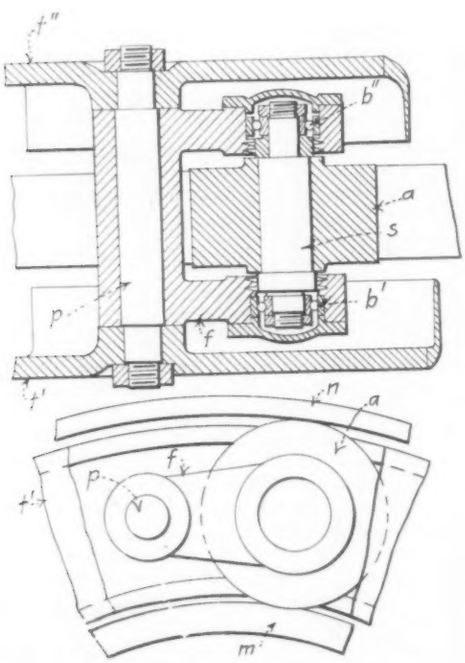
Such an arrangement would not work, however, in large bearings where the collars or rings are heavy, as the engineers for the Cammen interests have found out. There it became necessary to design a bearing that would work in the plate casting machine (Fig. 8), in order to carry a plate mold weighing some 11 gross tons and running at a peripheral speed of about 1½ miles per min. It was obvious that a bearing with a loose fit would not do for a steel roller of some 10 in. diameter and 7 in. long, and more accurate means of fitting would have to be provided, such as anti-friction bearings on the roll ends.

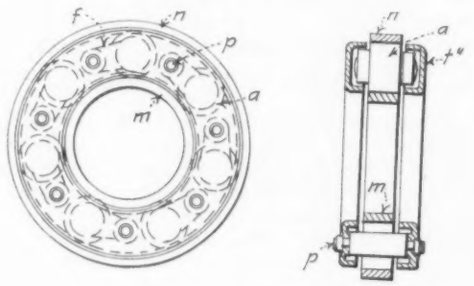
This involved, however, the difficulty that even a very small difference in the radial direction in the location of the bearing housings causes the working load to be carried on the end bearings of some of the rolls, instead of on the faces of the rolls themselves. As a result of this, a load is placed on the anti-friction end bearings for which they have not been designed, and which is far in excess of their carrying capacity.

It appeared, therefore, that with the usual type of roller bearings, even with anti-friction bearings in the roll end housings, it would have been a difficult and expensive job to achieve the close fit that was absolutely necessary in view of the heavy rotating weight and high speed of the mold. This was all the more so as it was desired to provide a roller bearing every 15 in. of the length of the mold, to prevent any possible distortion, and this meant, with a mold designed to cast plate 60 in. wide, four sets of bearings.

The worst difficulty was, however, that even after a young fortune might have been spent in the machine work on the bearings and rolls, there was no certainty that a perfect alinement of the rolls could be maintained in practice. In fact, there were good reasons to believe that such would not be the case. It became, therefore, necessary to design a special type of heavy duty bearing suitable for this kind of service (patents applied for), and a description of it is given here, as the same problem may be encountered in the design of other mill machinery.

The characteristic feature of all ordinary roller bearings is that the axis of the bearing is rigidly located. If we assume, therefore, that the centers of all rollers *a*, Fig. 3, are located on the periphery of a perfect circle, it would be also necessary, in order to obtain perfect operation, that the bearing surfaces of *m* and *n* be also perfect circles, and that they be perfectly concentric with each other, and with the circle of the loci of the centers of the rollers *a*. It is possible to do so theoretically, and to approach it closely enough for practical purposes in small bearings. As it was obvious that it would be extremely difficult to approach this condition in practice with the heavy (11 gross tons) molds of large diameter (70 in. outside) of the Cammen plate machines, it was decided to devise a bearing in which the axes of the rolls would be floating instead of being rigid. The bearing shown in Figs. 1 to 7 is the answer to this problem.

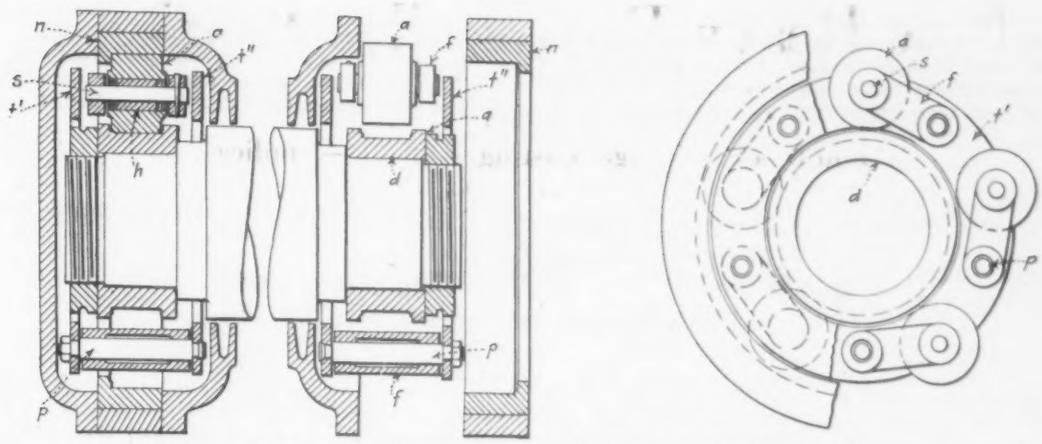




Figs. 1 to 4—Details of the New Heavy Duty High-Speed Roller Bearing. This is designed to carry an 11-ton metal mold in a centrifugal casting machine making metal plates. The mold revolves at a very high speed, which is facilitated by roller bearings

In this, the roller *a* mounted on shaft *s* is carried in anti-friction (ball or roller) bearings as shown, but, contrary to the usual practice, shaft *s* with its anti-friction bearings is mounted not in rigid rings, but in the articulated frame *f* which in its turn is mounted pivotally on pin *p* locating and holding the spacing rings *t'* and *t''*.

As a result of this, the roller *a* has two freedoms of motion: One, like the rollers in conventional roller



Figs. 5 to 7.—The Heavy Duty Bearing Applied to a Mill Motor Shaft

bearings, of rotation about the axis of the anti-friction bearings *b'* and *b''*, and the other of translation, together with the articulated frame, *f*, about the axis of pin *p*, and it is this second freedom of motion that gives it the ability to assume always the position at which the load would be carried on the faces of the rollers, and never on the anti-friction bearing on the roll ends.

The construction of the roller bearing is also greatly simplified from a manufacturing point of view. It is a simple matter to drill the rings *t'* and *t''* so as to make certain that the holes for pin, *p*, will line up with each other, and it is evident that for any reasonable radial displacement of pin, *p*, the frame, *f*, will allow the roller, *a*, to float about that pin, *p*, in accurate alinement with the inner race, *m* (which may be the shaft of the rotor, or as here the mold), and the outer race, *n*, which is really the frame of the machine.

As no load is really carried by the roll ends, the anti-friction bearing there need not be at all heavy, which materially affects the cost of the entire construction. Also, because of the same fact that the main load is carried on the faces of the rolls, and not on the bearings, it becomes possible to employ the very simple and cheap construction shown in Fig. 5, with the roller bearings, *h*, in the middle of the rolls instead of at the ends, and even in this case, the anti-friction bearing may be of reasonable size as compared with the load actually carried on the rollers.

The floating construction of the frames carrying the individual rolls made it possible to solve a problem which has been hitherto considered impossible of solution. Take a dynamo end shaft shaped as shown at *d*, Fig. 6, having at both ends shoulders, *q*. It is desired to use it as the inner race, *m*, of Fig. 3, but with an ordinary arrangement of rollers it would have been impossible to slip the rollers, *a*, over the shoulders, *q*, unless a split roller ring were used, and the disadvantages of this are too numerous and well known to need special discussion.

There is, however, no difficulty to fit the bearing shown in Fig. 7 over the shaft, *d*, notwithstanding the presence of shoulders, *q*. All that is necessary is to swing the rollers, *a*, out of the way, slip the bearing over the shaft, drop the rollers back into place, and fit the outer race, *n*, over them in the usual manner.

It is expected that the simplicity of construction and reliability of operation of the new bearing will make it possible to apply anti-friction bearings to many classes of mill machinery of the heavier build where the ordinary ball or roller bearing will not stand up in service or costs too much to install.

It may be added that the plate casting machine shown in Fig. 8 has been designed to cast two plate bars at once, each 60 in. by 80 in. by 2½ in. From the machine these plate bars go to a re-heating furnace, and thence direct to the rolling mill, no straightening operation being necessary. The only special attachment used is a pair of guide rolls in front of the first pass of the rolling mill, somewhat similar to the crimping rolls used in boiler manufacture, though performing an opposite function. Enough work has been done on this proposition to show that the cost of casting these plate bars will be, outside of royalties, under $1 per gross ton, and that one machine can cast in 24 hr. about 350 gross tons of plate bars of the size specified above.

There is one feature in connection with centrifugal casting of plate bars that may be of interest in these

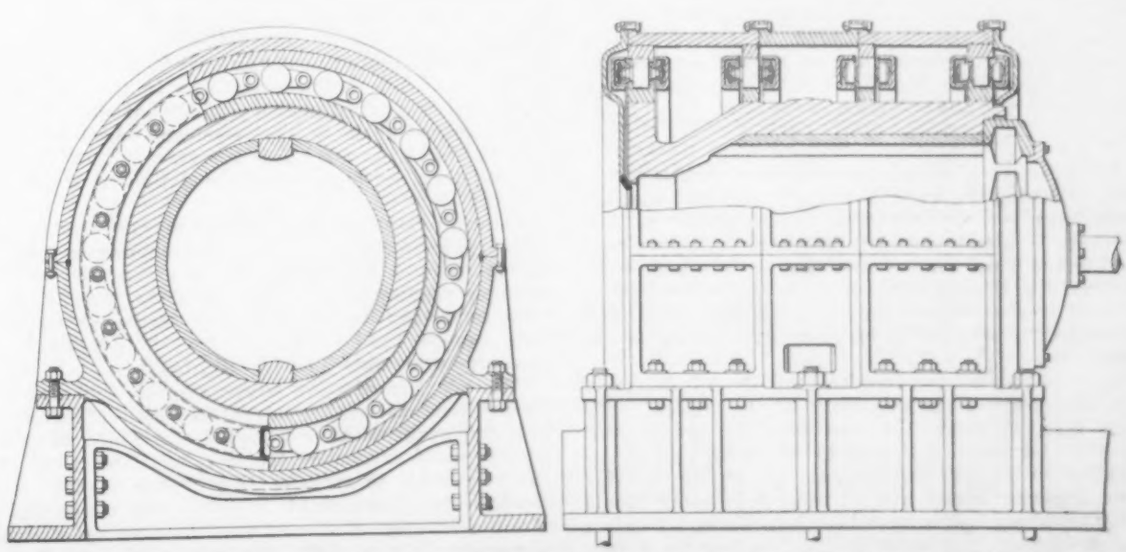


Fig. 8.—The Centrifugal Casting Machine for Plates for Which the Heavy Duty Roller Bearing Was Designed

days of labor shortage and high wages, viz., that, with the equipment designed, the entire operation, at the rate of better than 15 tons per hour, is handled from casting machine to furnace, and from furnace to rolls, by only four men (this does not include, of course, the pouring gang or the man that takes care of the bar heating furnace), making a total floor labor charge of less than 20 min. of man-time per gross ton. It is only in centrifugal casting and similar automatic operations that such a low labor consumption is possible.

Influence of Temperature in Steel Making Processes

Poor Results Follow Very High Working Temperatures—Iron Oxide and Its Solubility—Phosphorus as a Deoxidizer

At the Congress, held at Liège in June, 1922, there were many interesting papers on metallurgy. One of them was published in the November, 1922, issue of *La Revue de Metallurgie*. The writer was Ch. Clausel de Coussergues, and his subject was the "Influence of Temperature in the Manufacture of Steel." Practically all steel makers are agreed as to the great importance of the final or pouring temperature, but not enough attention is paid to the effect of temperature during the steel making on quality and cost. Some of the effects are brought out in the paper.

Very high temperatures can now be obtained in modern open-hearth furnaces or Bessemer converters, and the electric furnace allows temperatures to be reached that could only be hoped for in the older furnaces. The makers of special steels, however, have found that bad results follow very high working temperatures, and recent work with the electric furnace has shown that in general such steels are often considerably colder than open-hearth or basic Bessemer steels. The writer's discussion covers the metal from the time it is thoroughly liquid, and the major chemical reactions commence.

Oxide of Iron Produced First

The first reaction is the oxidation of the bath, at the same time that slag formation begins. In usual cases the iron is first attacked, and the oxide of iron produced is dissolved in the metal. In this metal are contained the other elements that have not yet had time to be oxidized. In such cases of rapid working furnaces, what is the most desirable temperature after fusion?

In the first place, the action of the slag on the metal being preponderant, it is recognized universally that the first step is to form the working slag. Regarding acid slags there is not much to say; they form naturally and at a very low temperature. With the basic process, on the other hand, a slag must be formed artificially. In general it is a lime slag, the fusion temperature of which is high, although it may be somewhat lowered by carefully regulating the composition or by the use of fluorspar, but the reaction temperature of these slags is always very high. It is good practice to reach a high temperature as rapidly as possible, which is above 1600 deg. C. This high temperature is also favorable to the oxidation of the bath.

Solubility of Iron Oxide

If the curve of solubility of oxide of iron is examined (following the work of Eichoff) it is seen that the curve rises very rapidly with the temperature. The solubility is almost zero at 1400 deg. C.; 1 per cent at 1700 and 3 per cent at 1800 deg. C. The higher the temperature, therefore, the more is the percentage of oxide of iron removed from the saturation point, and as a result it is easier to bring about oxidation of the metal.

Certain plants have long realized the advantage of high temperatures at this stage of the process. For more than 20 years the engineers at the Denain plant in the north of France have attached great importance to the physical temperature of the iron for their Bessemer plant, and at present in many plants using liquid pig iron in open-hearth furnaces, the orders are strict that iron must only be charged in a very hot furnace.

It is the formation of the slag that determines the temperature of this first period, but experience agrees with theory that it is best to raise the temperature as quickly as possible. During this period most of the silicon is oxidized; manganese, carbon and phosphorus only have time to become partially oxidized; indeed, very little phosphorus is oxidized until the slag is formed. Once the slag is formed and the bath completely oxidized, which takes place at the same time in rapid working furnaces, the removal of the three last named constituents proceeds rapidly at the expense, mainly, of the oxide of iron contained in the bath and the slag, and only partly by the bringing in of new molecules of oxygen.

Phosphorus as a Deoxidizer

The influence of the temperature of these reactions is of great importance, and regulates the rate of removal of any one of the impurities compared with another. At high temperatures phosphorus is not a deoxidizer of steel in the presence of carbon; at low temperatures, on the other hand, it deoxidizes notwithstanding the presence of carbon. This statement perhaps runs contrary to certain scholastic opinions. However, many engineers and scientists, for more than 20 years, have doubted the truth of the generally admitted statement that in certain classes of apparatus at least the phosphorus cannot be removed in the presence of carbon, because for a long time examples of dephosphorization have been known in all the plants.

It is evident that the theoretical study of dephosphorization, in presence of carbon, has not yet been completely worked out. In practice steel plant metallurgists, who for several years have sought to remove phosphorus in presence of carbon, have found that they are completely successful if they do not greatly exceed the ordinary fusion temperature of 0.80 per cent carbon steel, and if they have a liquid slag rich in lime and an oxidized bath.

Carbon Promotes Low Temperature

The presence of carbon in the bath favors the maintenance of a low temperature, because the melting point of cast iron is much lower than that of low carbon steel. Further there is a double advantage in removing phosphorus while carbon is present. In the first place a material is retained in the bath, the carbon, which is often required in the finished steel and which does not furnish heat if burned. This corresponds to a shorter refining time, or to a reduced quantity of ore being required.

Secondly the presence of carbon and manganese (the behavior of which is somewhat similar to that of carbon) gives a less oxidized bath at the end of the ordinary refining period. For all these reasons it is very important to endeavor to remove phosphorus before carbon and manganese, and to do this it is necessary to operate at a low temperature.

The adoption of a low temperature at this stage of the practice has another advantage. At the beginning it is important to have a high temperature to favor absorption of oxygen by the iron, but later when the effort is made to transfer this oxygen to the other constituents of the metal it is best to keep in the region of low solubility. The coefficient of solubility of oxide of manganese also varies with the temperature, but it seems that it varies less rapidly than that of oxide of

iron. For all these reasons therefore it is necessary to lower the temperature after the slag is once formed and the bath oxidized.

Final Deoxidation

Finally comes the removal of the excess of oxygen remaining in the metal, that is, the final deoxidation. The amount of oxygen to be removed will be less if the last refining has had to remove only carbon and not phosphorus, and, further, this amount will be less if the bath is maintained at the lowest possible temperature. Le Chatelier showed in 1912 that in the case of a very soft steel with 0.055 per cent carbon at 1600 deg. C. the amount of FeO remaining would be 0.11 per cent. If the same calculation is made at 1500 deg. C. the amount of irreducible FeO is not more than one part in a thousand, so that by working at a low temperature the bath is much less oxidized at the time when the costly deoxidizers, silicon, manganese and aluminum, are to be added. From the standpoint of cost as well as quality it is therefore of interest to cool the metal after having superheated it.

Practical operators in many cases follow this general rule without perhaps knowing why. In many basic Bessemer plants it has been found that deoxidation with spiegel gives better results than that with ferrosilicon at high temperature. This is explained by the cooling effect of the considerable weight of spiegel which is required. Also in the Bertrand-Thiel, or similar open-hearth processes, the advantage of a lower working temperature in the second period is recognized. A suitable method of operation would seem to be to work in one furnace and after the slag has been formed to make a considerable addition of lower temperature material, such as scrap or liquid pig iron, which will use up surplus calories of heat for the treatment of an addition to the charge. It would therefore seem well to consider rapid basic steel making practice as made up of three periods:

1. The period of formation of slag and oxidation of the bath, during which in basic open-hearth and electric furnace practice a part of the charge is worked with.
2. The period of deoxidation by phosphorus with the addition of the rest of the charge, and, if necessary, a further small addition of oxygen.
3. After refining, the removal of carbon in excess; then final deoxidation by the usual additions or by the reducing slag of the electric furnace.

G. B. W.

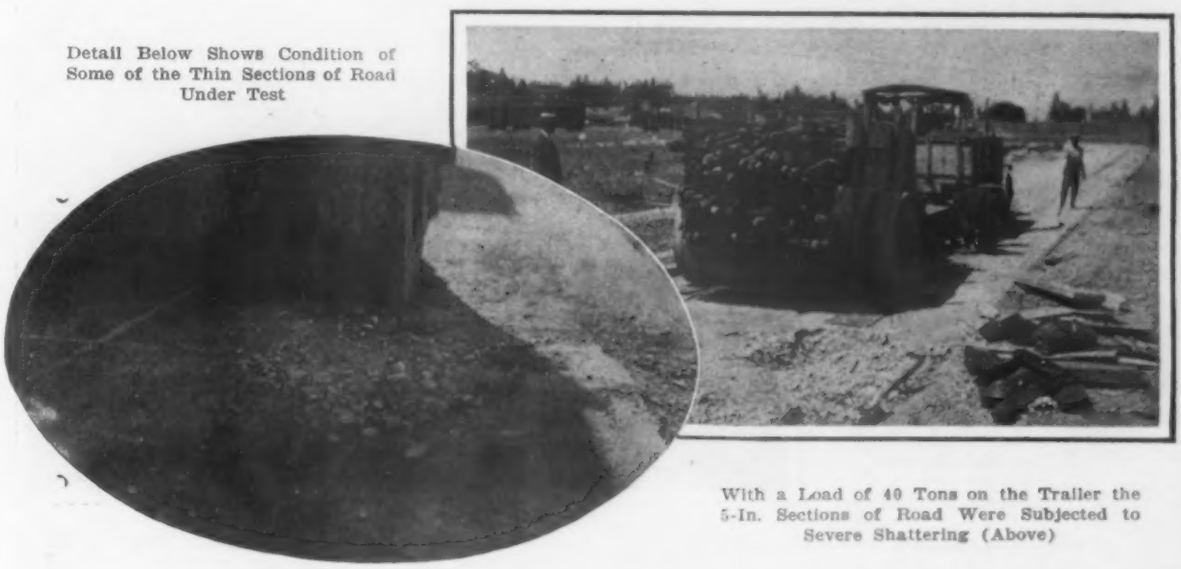
Reinforced Concrete Road Tested to Destruction

In THE IRON AGE, Nov. 10, 1921, page 1222, was the description of a test highway of concrete about one-quarter mile in length and consisting of 13 sections differing as to thickness of slab, quantity and placing of steel reinforcement, etc. The slabs varied from 5 to 8 in. thick. Four of them had no reinforcement, these including both the 8-in. sections. The others had reinforcement varying from 20 to 69 tons per mile.

Some sections of the road have now been practically demolished under the intensive testing to which the entire road has been subjected. At the conclusion of the regular tests, however, the concrete pavement had not failed sufficiently to give final conclusive results. It was desired, therefore, to make further test to determine the load or tonnage required to cause complete failure of different sections. Accordingly, supertests were carried on for seven days by means of a truck drawing a two-wheel trailer loaded with pig iron.

In these tests the trailer, equipped with dual 5-in. steel tires and carrying a load of about 16 tons, made 105 complete circuits of the elliptical highway and few places were shattered on the 5-in. concrete base. The trailer was then loaded to about 30½ tons and there was a general shattering of the 5-in. section under the rear wheels in many places. One 5-in. section, however, which was reinforced both top and bottom, was not seriously affected.

When the trailer was loaded to 50 tons it cut entirely through one 5-in. section and then stuck. After 15 tons had been removed, the 35-ton load remaining made three circuits, which resulted in a continuation of shattering 5-in. sections but the thicker sections were not appreciably affected. The load was then increased to 40 tons and two circuits made, during which shattering of 5-in. sections continued. The trailer was then loaded again to 50 tons and three circuits made. The rear wheels cut two furrows almost entirely through all but one of the six 5-in. sections. The one which was reinforced top and bottom was cracked only slightly and showed very little shattering. Two sections, 6-in. thick and reinforced top and bottom, also were shattered very little.



Detail Below Shows Condition of Some of the Thin Sections of Road Under Test

With a Load of 40 Tons on the Trailer the 5-In. Sections of Road Were Subjected to Severe Shattering (Above)

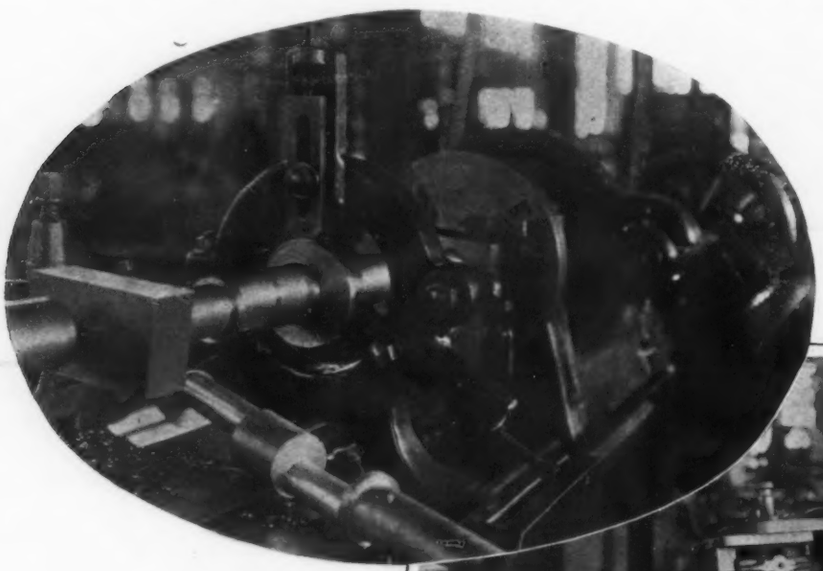
The strike of machinists at the plant of the U. S. Fastener Co., South Boston, Mass., has been called off by union officials. It started last year, some 50 men being involved. The plant is now running as an open shop with 38 machinists and production has been materially increased.

TIME SAVING OPERATIONS

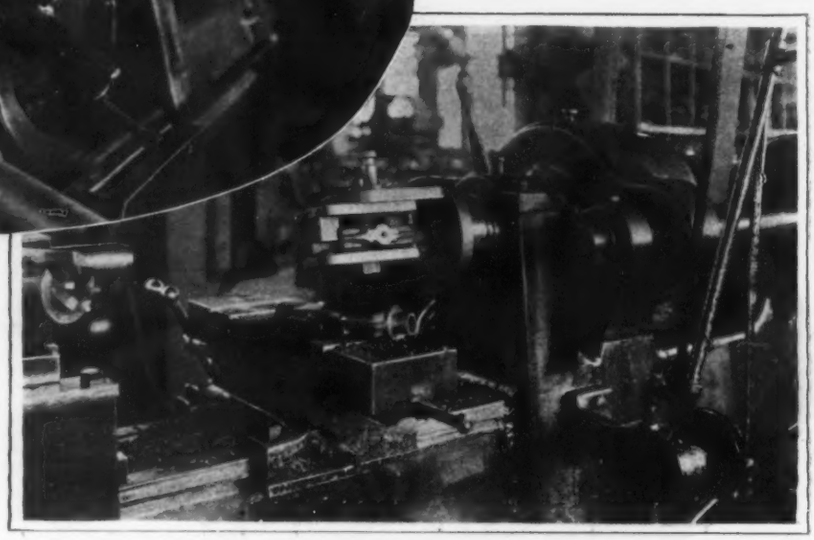
Labor Saving Fixtures Used in Two Cases Not Warranting Extensive Apparatus

The manufacture of hat making machinery has called for considerable ingenuity in designing unusual mechanical motions as well as the employment of more common designs. In many cases the demand for certain types of machines is not sufficiently heavy to warrant extensive jigs and fixtures for producing parts employed in these machines. This fact has called for the simplest kinds of labor saving fixtures to eliminate an operation wherever possible. Doran Brothers, Danbury, Conn., have worked out several simple, time saving methods, two of which are illustrated herewith.

The first of these is the manner of turning the wrist pins of two throw crankshafts. The usual manner of doing this operation would be to drill three center holes in each end of the shaft. Doing away entirely with this operation, the company has made a pair of throw blocks with the three holes drilled. These blocks are then hardened and ground. They are attached to the ends of the shaft on which the cranks are to be turned, and the whole is swung in the lathe centers. A pair of collars is placed on the shaft's center bearing for support. These collars are provided with an eccentric hole which fits the shaft bearing, the throw of the eccentric being the same as that of the crank. These eccentric collars ride in the steady rest jaws, thereby giving rigid support to the shaft while being turned.



(Below) Hardened Throw Blocks Which Are Drilled to Correspond With the Throws of the Two-Throw Crankshafts Are Attached to the Shafts in the Turning Operation and Obviate the Necessity for Drilling the Center Holes in Each Crankshaft, Thereby Saving One Operation



(Above) One Set-up in the Indexing Fixture Assures Proper Alinement of Holes Drilled from Four Sides. The adjustable thrust stop, which is mounted in the turret lathe spindle, permits a hollow milling operation at one end without disturbing the alinement

A number of jobs are handled in indexing fixtures in turret lathes. The spider shown is held in the fixture on three points, a Vee block, hardened, and two hardened pins at the other end. An adjustable stop is threaded into the face plate which carries the fixture. This stop is used simply to absorb thrust. The operation at the front end of the casting which rests in the Vee block is drilling, reaming and facing. The opposite end is also hollow milled. The fixture saves considerable time which would be required for individual setting up for each hole and also assures proper alinement.

Bosch Sales Manager Investigates Trade Conditions in Twelve States

During a trip through the important Western agricultural belt, Alfred H. Bartsch, general sales manager of the American Bosch Magneto Corporation, Springfield, Mass., found the trade enjoying excellent business in comparison with the volume and profits of last year. The trip, covering a period of 23 days, included day stops in 19 cities in the States of Michigan, Illinois, Wisconsin, Minnesota, Nebraska, Colorado, Missouri, Kansas, Oklahoma, Texas, Louisiana and Tennessee.

"It was expected that general business would be found improved over last year," said Mr. Bartsch, "but as to the future, that is, the rest of the year, it is still somewhat of a problem, especially in the agricultural West, where there has not been the percentage of increase found in the East.

"I found business in general to be extremely active with indications of continued progress. There still remains, it is true, a decided undercurrent of unsafety for the future, both as regards business and maintenance of prices. This reflects itself in purchases of many lines, especially among wholesalers who are watching their stocks very carefully—a condition which is suggestive of healthfulness. The farmer is a better prospect than he has been since the spectacular boom years of 1919 and 1920."

Port Development in Alabama

BIRMINGHAM, ALA., June 11.—The port aid amendment allowing Alabama to spend $10,000,000 in development at the port of Mobile has been declared constitutional and this development will begin as soon as the Legislature this summer makes appropriation for the work. Mobile commerce in the metals has greatly increased and superior port facilities coupled with low rates via the Warrior River are calculated to give as great impetus there as took place at New Orleans under State port aid. The Alabama system is copied after that of Louisiana.

Questions Relating to Trade Associations

Decision of Supreme Court in Linseed Oil Case Starts Discussion, but Department of Commerce Plans Further Cooperation

WASHINGTON, June 12.—The decision of the Supreme Court handed down on Monday of last week in the so-called Linseed Oil case has left the status of trade associations in doubt. In this case the court held as illegal the activities of the Armstrong Bureau, which is composed of manufacturers of linseed oil, and placed it on the same basis as it did the well-known Hardwood case.

There are varying opinions regarding the probable effect of the Armstrong Bureau decision. Some attorneys view the decision only as a reaffirmation of the principles laid down in the Hardwood case. As such, they maintain that it does not provide any added interpretation of the Sherman anti-trust law. It is understood that this is the view of Government officials whose departments are actively cooperating with trade associations and who have had counsel analyze the Linseed Oil decision. While they will authorize no formal official expression, apparently it is their opinion that the decision strikes again only at "open price" associations. It is maintained that the ban placed by the Supreme Court is on the exchange of price information and certain other activities, such as alleged attempts at dividing sales and distribution territories. The vast majority of trade associations, it is contended by this school of thought, are unaffected by the decision and may continue operations without fear of legal action.

Significant Action

The fact that the Department of Commerce is further developing cooperation with trade associations affords the implication that it does not view the Linseed Oil decision as being so sweeping as to threaten the existence of all trade associations. Reflecting the growing cooperation between the Department of Commerce and trade associations is the fact that a new division of the department, which will deal with retail trade, already has begun active participation with trade associations and moreover the latter have made appropriations to assist the new division in conducting studies that it will make.

Secretary Hoover from the outset has been a vigorous opponent of the "open price" associations. At the same time, he has been a warm champion of those associations which he views as being constituted along legitimate lines and given over to the public dissemination of such information as that relating to production, consumption, stocks and distribution. Apparently, the Department of Commerce does not believe that the great majority of trade associations will in any way be affected by the Linseed Oil decision and that they will not construe the Linseed Oil decision as a warning for them to disband. On the contrary, it appears to be the view that trade associations now cooperating with the Department of Commerce, Department of Agriculture and other governmental organizations, will continue their efforts as heretofore.

Secretary Hoover's Position

It is recalled, however, that Secretary Hoover repeatedly has gone on record as being of the opinion that trade association activities are under "undue restraint." He has favored modification of the Sherman law so that trade associations could be passed upon and given a clean bill of health by a Government body, the Federal Trade Commission having been suggested by Mr. Hoover with the proposal that its recommendations be made subject to approval by the Department of Justice. Legislation of this character was introduced in the recent Congress. It never reached the stage of hearings, although it had been announced they would be held.

It is understood in Washington that while many trade associations originally were in favor of legislation of this kind, they became lukewarm or actually hostile toward it when they found that the Federal Trade Commission would be empowered with authority to pass upon their activities. They have the feeling that the Trade Commission, which has led the movement in bringing charges against trade associations, is unduly prejudiced against them, although some members of the commission, particularly Commissioner Gaskill, have been champions of what they term legitimate trade associations and have encouraged their activities.

Attitude of the Administration

In May, 1921, two months after the inauguration of the Harding administration, its cabinet members took up the trade association subject actively. It was sought to draw a distinct line between those that are legitimate and illegitimate. Attorney General Daugherty at that time announced that trade associations engaged in "open price" practices would be prosecuted, and that legitimate organizations would not be molested but rather would be encouraged. Correspondence between Mr. Hoover and Mr. Daugherty developed. In a letter to Mr. Daugherty, the Secretary of Commerce strongly supported the great majority of trade associations, but condemned those which, Mr. Hoover said, were engaged in the collection of data on prices for the exclusive use of their members. It was his claim that some of these associations were charged with "delimiting areas of commodity distribution among their members and other misuse of information." He then suggested that the Federal Trade Commission and the Department of Justice be given the power indicated and which would require modification of the Sherman law. The purpose was to remove all uncertainty, because, as he stated in his letter, "there is nothing so destructive of business as uncertainty, and business has inherently enough to deal with without this one."

Another Point of View

But despite what appears to be the general opinion that the great majority of trade associations are not affected by the Linseed Oil decision, and that the only new element in the decision is that it brings the so-called "individual contract system" of collecting and disseminating price data under the same restraint as that placed upon open price associations, there are those who believe the opinion has increased uncertainty as to the status of trade associations.

Those taking this view say it is supported by the very fact that the operations of the Armstrong Bureau were upheld in every phase of its activities by Judge George A. Carpenter of the District Court of the United States for the Northern District of Illinois. The decision of the lower court, while reversed by the Supreme Court, is pointed to as evidence of the fact that some of the best judicial minds in the country hold different views on trade association work.

Another Automobile Production Record

Production of automobiles in May has been reported by the National Automobile Chamber of Commerce at 404,992 cars of all kinds, compared with 381,224 cars in April. Each of these figures shows successively the highest month's output ever reported. For the first five months of this year production reached 1,660,781 cars, which is higher than the total year's production of any year preceding 1917, and is almost exactly equal to the production of the 12 months of 1921.

AMPLE CAPACITY

Locomotive and Car Building Plants Will Be Able to Take Care of All Orders

WASHINGTON, June 12.—Railroad locomotive shops are able to complete and ship in the present year all the orders they have on their books, while the installed capacity of the car building industry is greatly in excess of that required to complete their orders for cars before the end of the present year. Official announcement to this effect is made in correspondence submitted to the Interstate Commerce Commission by Director Julius H. Parmelee of the Bureau of Railway Economics. It is based on a survey made by the bureau through a questionnaire sent to locomotive builders and railroad car manufacturers. The data were sent to Commissioner Clyde B. Aitchison in reply to his request made to Dr. Parmelee when the latter was before the commission in connection with the hearing on the adequacy of railroad equipment. Dr. Parmelee also sent a questionnaire to all of the railroads pertaining to equipment bought and on order. He has received replies from a great majority of the Class I railroads and has been able to make a careful estimate of the total outlays for all these lines.

Replies as to the ability of locomotive manufacturers to complete orders during the present year were received from President Andrew Fletcher of the American Locomotive Co., President S. M. Vauclain of the Baldwin Locomotive Works and S. J. Allen, chairman of the executive committee of the Lima Locomotive Works. The substance of their replies is identical. Speaking for car builders, President W. F. M. Goss, of the Railway Car Manufacturers' Association, said:

"The installed capacity of the car building industry is greatly in excess of that required to complete all orders now on the books prior to the end of the year. This statement is based upon the totals of the industry. The performance of individual concerns must, of course, be judged by individual conditions. Some can make deliveries before the close of year considerably in excess of those they now have on order."

A table submitted by Dr. Parmelee to the commission shows that the grand total for all Class I railroad improvements for 1923 is estimated at $1,108,672,304. This compares with $431,542,115, expended for actual additions or improvements in 1922. Of the 1923 figure, $197,447,045 is being spent for locomotives; $415,209,512 for freight cars; $121,933,563 for additions and improvements to track; $27,028,562 for standard rails and $57,363,507 for shop and engine houses, including machinery and tools.

BRITISH FOREIGN TRADE

April Steel Exports Largest Since 1913—Imports Very Heavy

Exports of iron and steel from Great Britain continue to mount. In April they were the largest for any month this year and exceeded anything for any month since 1913. The total was 398,507 gross tons. These compare with 380,136 tons for March, 324,460 for February and 370,028 for January. Scrap is included in these figures. Imports in March were 133,929 tons, or the largest for any month this year. In November, 1921, the imports were 184,064, or the largest previous receipts.

The steel export trade thus far this year is, therefore, the largest since 1913 as shown by the following table, which gives comparative data of both exports and imports, scrap being included.

British Steel Exports and Imports, Gross Tons

	Exports	Imports
January, 1923	370,028	133,182
February	324,460	130,008
March	380,136	120,908
April	398,507	133,929
Average per month, 1922	295,980	82,215
Average per month, 1921	144,885	152,734
Average per month, 1920	274,881	128,685
Average per month, 1919	188,519	50,801
Average per month, 1913	420,757	195,264

More detailed data of the exports are as follows:

Principal British Exports, Gross Tons per Month

	1913	1922	April 1922	April 1923
Pig iron }	93,700	66,159	37,040	94,607
Ferroalloys }			5,940	16,648
Steel rails	42,200	21,300	28,398	35,609
Steel plates	11,200	6,700	8,036	13,802
Galvanized sheets	63,500	43,600	40,454	50,361
Steel bars, rods, etc.	20,900	19,100	14,841	26,678
Tin plates	41,200	37,400	36,055	41,015
Black plates and sheets	11,700	18,700	5,707	4,391

Data as to importations of importance are as follows in tons per month:

	1913	1922	Jan.-April 1923
Iron ore	620,000	289,400	526,505
Manganese ore	50,100	28,109	36,345
Pig iron and ferroalloys	18,000	12,800	13,148

Exports of scrap iron and steel in April were 11,550 tons, or 11,800 tons per month for the first four months of this year, as compared with 12,880 tons per month in 1922. In 1913 there were 9600 tons per month.

The rolling mill of Frederick Cowin & Co., at Joliet, Ill., purchased several months ago by Briggs & Turivas, Chicago, is being dismantled and the equipment is being offered for sale.

Lancaster Iron Works Expanding

To provide so far as possible for the demand for its products, the Lancaster Iron Works, Inc., Lancaster, Pa., builder of steel tanks of every description, as well as steel plate construction work generally, brick making and clay working machinery and other specialties, is now adding to its facilities at Lancaster. To the machine shop, which was 54 x 230 ft., is being added two extensions, one 54 x 106 ft. and another 54 x 144 ft., thereby adding over 13,000 sq. ft. to the shop in service and in which space was found inadequate. The 54 x 144 ft. extension will be used as an erecting shop. It will be covered by a 10-ton Box crane. The crane and other equipment required for the extensions have been purchased. The company has also doubled the capacity of its foundry.

These expansions have been necessitated largely by the activity of the brick making and clay working machinery departments. In both of these departments the sales of the company this year are practically double what they were last year, and last year were very nearly double what they were in 1921. The greatest increase has been in the brick machine department, where the company manufactures the AutoBrik machine for the automatic production of bricks. The machine shop and foundry have been running at capacity for the last year, the former night and day since Jan. 1. The company's plate shop is 120 x 715 ft., thus containing 85,800 sq. ft.

New Rates to the South

BIRMINGHAM, ALA., June 11.—Jobbers in iron and steel products figure a saving of $2.20 a ton after July 1, owing to proposed rail rates from Pittsburgh. This will reduce local prices on wire mill products except bars by that amount, local mills being governed by the Pittsburgh price plus the freight. So far no stated objection has been filed against publication of the new rates on the date fixed, although that may be done.

The McKinney Steel Co. has placed contracts with Arthur G. McKee & Co., Cleveland, for equipment to be installed in connection with the rebuilding of its Nos. 1 and 2 River blast furnaces. The order includes a McKee revolving distributor for each furnace with automatic electric control, electric rigs for automatically operating the furnace bells and five Kling goggle valves for controlling and by-passing the gas supply of the two furnaces.

Executives Discuss the Business Cycle

Strategy of Meeting Cyclic Changes Receives Practical Consideration at Taylor Society Meeting—Sales and Planning Topics Also Discussed—Inspection Trips a Feature

THE business cycle, with its recurring booms and depressions and unemployment as the outstanding feature of the cycle, were presented and discussed as an intensely practical problem confronting industrial managers, at the meeting of the Taylor Society, held at the Hotel Onondaga, Syracuse, N. Y., June 7 to 9.

Stabilization may be considered the keynote of the meeting, which was made up of three sessions, at each of which a paper was presented and discussed. Plant inspections were also a feature, as heretofore. The phases of stabilization presented included, first, that attained through planning productive processes; second, a higher plane attained through a steady flow of jobs resulting from thorough market analysis and setting up of sales-production-financial programs and schedules; and third, a still higher program to be secured by stabilizing operations of the particular business in the economic cycle, and stabilizing all industries in the cycle by joint effort to flatten the curve of the cycle.

All sessions were well attended, discussion was animated, and it was felt generally that the meeting was one of the best in the history of the society.

Unemployment and Business Cycles

An outstanding paper was on "Safeguarding Industry by Stabilizing Employment," read by Willford I. King, National Bureau of Economic Research, New York, which conducted an investigation for President Harding's Conference on Unemployment, showing the facts concerning cyclical unemployment, and in addition describing various measures for its relief. The facts brought out related to the depression of 1921 and how labor conditions were affected at that time.

Some of the problems which arose during the investigation and the methods of attacking them were outlined. It was brought out that the depression of 1921 brought about a tremendous decline in employment, and that relatively few workers shifted from one industry to another. It was revealed that about one-seventh of all the workers in the country were idle during the dullest part of 1921. Most of those at work put in full time, but there was a sufficient number of part-time workers to reduce the total number of employee-hours worked by about one-sixth. An unexpected finding was that the tendency to lay off employees was much stronger in large enterprises than in small ones.

An illuminating outline of the sequence of events which seems to characterize the business cycle was given by Mr. King. The tendency for retail prices to remain high after factory prices have fallen sharply was said to have long deceived economists, and has led to the belief that the force causing the decline in prices must originate in the factory. "The truth seems to be," he said, "that the initial impetus comes from the consumer when he fails to buy the expected quantity of goods from the retailer."

In a discussion of the chief effects of the cycle it was pointed out that when the depression hits the factory and wage earners not taking kindly to wage cuts, the usual solution is to lay off a large number and put some of the other employees on part time. During the 1921 depression this process continued, he said, until it reduced factory employment by 30 per cent, and in metals and metal plants the reduction was slightly over one-half. Loss due to overhead is usually paid out of profits during boom times. The employee, however, is without an income and his gains from larger wages during the boom are usually less than the extra profits of the employer. In discussing this situation Mr. King expressed disapproval of profit-sharing and said that he saw no prospect of gain if the workers obtain a controlling voice in the direction of industry. The worker has, however, a legitimate right to demand that a system be worked out which will permit him to be employed steadily, said Mr. King. Stabilizing employment from month to month and year to year was emphasized as a duty. Sound economic policy, he said, does not demand that we give men unemployment insurance, but rather that we keep them steadily engaged at their regular tasks.

Preparation for Dull Times Urged

Conservatism during the boom was a factor emphasized in stabilizing employment. "Raise wages as little as possible," said Mr. King, "thus avoiding the necessity of severe wage cuts at a later date; adopt a hand-to-mouth policy in buying raw materials; scrutinize orders from your customers; go slow in accepting orders from men whose credit is not of the best; see that all contracts are definite so that the chance for cancellation is reduced to a minimum; postpone building additions to your plant which seem necessary; make the old machinery do a little while longer; reduce your stocks of finished products to a minimum; and above all, accumulate cash. Sell all but the most gilt-edged securities; dispose of any unnecessary assets, and strengthen your cash position at all costs."

It was indicated that by late 1924 or early 1925 business will again be dull, and the present was pointed to as the time to prepare. Studying the statistics of one's own business to see what the long time trends are, and planning the buildings and new machinery required to take care of the normal growth of the enterprise, were emphasized. "Plan now to make goods for stock during the lean months while materials are cheap," said Mr. King. "Arrange also a campaign for securing orders well in advance. If you go into a depression with small stocks on hand you will not find that the stock manufactured during the dull times will greatly overload your warehouses." A few manufacturers have demonstrated, he said, that by careful long-time planning and conservative action during the boom, they are able to guarantee steady work to all their employees.

By studying the business cycle until you know the position you occupy in it at every time, and understanding the relation of the activities of your own business to the cyclical fluctuations of industry in general, you will be able to approach, if not attain, said Mr. King, stability in operations from year to year.

Discussion

Carleton F. Brown, general manager Corona Typewriter Co., Inc., Groton, N. Y., in discussing Mr. King's paper, emphasized the desirability of uniform production in the business cycle as well as in the seasonal cycle. He said that steady employment of workers is an advantage to the manufacturer, who should bend every effort toward this end. Reducing cyclic fluctuations would promote more precise and economic management, he said, and pointed to companies which first having solved some problems of seasonal fluctuations of production, have extended the scope of their plans to the solution of the problems of cyclic fluctuations with notable success. It was pointed out that not every firm or industry will be able to utilize the methods of other firms or industries. Knowing the theory of the cycle, study of general business conditions, and knowing at all times one's position in the cycle, and formu-

lating definite sales, production and financial policies were urged by Mr. Brown. Having the will to resist in periods of prosperity the lure of large sales and big profits obtained at the expense of the future of one's business, and having the courage to plan and execute for the future when in the depths of depression, were emphasized.

Dr. N. I. Stone, general manager, Hickey-Freeman Co., Rochester, N. Y., in an illuminating discussion of the paper, said that the phenomena of the business cycle have their roots in the deeper foundations underlying the economic structure and are practically beyond the reach of the engineer, dealing with the technical problems of the individual plant. Dr. Stone maintained that if all plants were operated at the highest efficiency there would still be industrial depressions and booms so long as the general conditions which cause these distinctly modern phenomena continue to prevail.

Credit was said to be the outstanding feature of the present industrial order, and more responsible perhaps than any other for the phenomenon of recurring business cycles. Modern industry, he said, is built on credit, and is constantly at work creating a supply in anticipation of a future demand. "The recurrence of the business cycle will not be prevented," said Dr. Stone, "as long as there is no central authority to gage demand and to keep the production of an entire industry down to that demand; so long as each individual company is free to enlarge its output without regard to the output of its rivals, and is under constant pressure under the workings of competition and the economic law of increasing returns to keep on enlarging the scale of its operations."

Control of credit with the business cycle in mind was said to be pregnant with great possibilities, and the possible service of the Federal Reserve Board in the matter outlined. The deferring of public works operations during boom times and proceeding with them in dull times was mentioned as another factor in flattening the curve of the cycle. The management of enterprises could also aid, he said, by seconding the efforts of the Government in doing certain work in slack times instead of busy times as heretofore. It was also suggested that wherever possible goods should be produced for stock during dull periods.

The Selling Machine of 1923

How the sales organization will meet its responsibility of providing the basis for good factory management, continuous operations and employment, in the period of intense competition ahead, was the object of a sales session at which E. W. Kendall, general sales manager, Pass & Seymour, Inc., Syracuse, N. Y., presided.

Sales planning as an essential part of sales management, the necessity of close coordination of sales, production and financial departments, and the characteristics of the sales organization that is to operate successfully from now on, were discussed by H. R. Wellman, consultant on sales and professor of marketing, the Amos Tuck School, Dartmouth College, in an address on "The 1923 Model Sales Machine."

"Sales departments generally have accepted certain principles of management and are now beginning to apply them, Professor Wellman said, "and it seems to be evident that scheduled sales and scheduled production make profits and that neither department can operate at a profit by itself. The same development will characterize sales planning as has already characterized scientific shop planning and management." It was stated that in sales we are now suffering the specialist period.

What was termed the "dead level of efficiency," with all of the plants of the country manufacturing on the same high grade, planned production level, and with sales departments having made the same advances, was cited as a problem of the future. The problem presented seemed to be to forecast the possible additional consumption for the new outfit, and it was brought out that we reach a point then where it becomes apparent that science will not alone solve the problem of distribution.

Over-production and forced selling were discussed in detail. "While over-production or saturation may not be possible from an economic point of view," said Professor Wellman, "it is quite possible and is very much in evidence in certain lines, from a business point of view. With all of this warning, we have had the constant urge for more production and sales. This has come from the banking group," he said. He quoted and emphasized the opinion of a sales manager who said that most of the sales problems of today could be solved if the bankers could be brought to see the cost of getting the last $100,000 worth of sales. This condition, it was pointed out, is largely confined to groups of manufacturing interests which are directed and controlled by financial groups. The effects of this type of forced selling were analyzed and the increased cost of using more advertising cited. He urged the regarding of advertising as sales effort, to be applied by the manufacturer as he would regular sales effort.

The necessity for harmonious working of the finance, production and distribution departments was emphasized. While sales planning is reaching the production level in advancement, finance, it was said, "should be brought to understand the necessity of working with the other departments; it should, in brief, learn merchandising. In the old days finance could estimate possibilities in terms of plant production. Today it must estimate probabilities in terms of sales as well as production."

In describing the 1923 model sales machine Professor Wellman said that it will deal with facts, not theories, and will operate on *now* statistics. It will accept sales planning after research and analysis, not as an experiment but as the most essential part of the organization. It will place the results of its planning before the financial and production divisions and will then work in harmony with the budgeted plan of the three divisions and base its sales-operating plans upon the facts as established.

"If the driver of this machine, the sales manager, finds that the field he formerly occupied is now overcrowded," said Professor Wellman, "he will improve his product so that it will make a new and open market; devise new uses for his product for the same purpose; or make a new product that his analysis shows is needed. If the market analysis indicates that he should do so, he will even recommend to his associates that they reduce their capitalization by liquidation until a point has been reached where profitable sales can be made, or that they increase their capital and fight to the finish to eliminate this new competition."

Having set its house in order, the new machine will then begin its real test, the task of merchandising successfully in a world of changed and changing conditions, said Professor Wellman. Finding new barometers was mentioned among other activities bearing on the general market problem and facing the necessity of creating a personality for its product among customers and prospects was brought out.

Creed W. Fulton, works manager Goulds Mfg. Co., Seneca Falls, N. Y., discussed the paper.

Further Development of Planning Function

The remaining sessions were devoted to the organization and methods of the planning room, the lesson of this part of the program being presented in two ways; by an analytical discussion and by observing in action the planning departments of two companies known for successful management methods.

A paper on "The Planning Department as an Instrument of Executive Control," was read by Keppele Hall, superintendent of planning, Joseph & Feiss Co., Cleveland, at a session presided over by S. H. Cook, vice-president Brown-Lipe-Chapin Co., Syracuse, N. Y.

"This department," said Mr. Hall, "is primarily one of service. It is performing for other departments certain tasks that have to be done by someone, somewhere, somehow; and by its performance it is lowering the cost of production." The proof of its value in the reduction of costs was said to be evidenced by the large number of important companies which boast of their "planning department." "Most of these," said

Mr. Hall, "are far from being scientifically conceived or operated according to our proved theories, but they indicate that industry is reaching out for something better in management, and is inevitably approaching a realization of where that need may be satisfied."

Assuming a well conceived and operating department into which have been gathered all the activities usually associated with planning, Mr. Hall discussed the way in which it may be best utilized, what features must be emphasized and strengthened to make it better serve its ultimate purpose.

Howard G. Benedict, A. J. Deer Co., Inc., Hornell, N. Y., and Robert Anderson, production manager, Bowen Products Corporation, Auburn, N. Y., discussed Mr. Hall's paper.

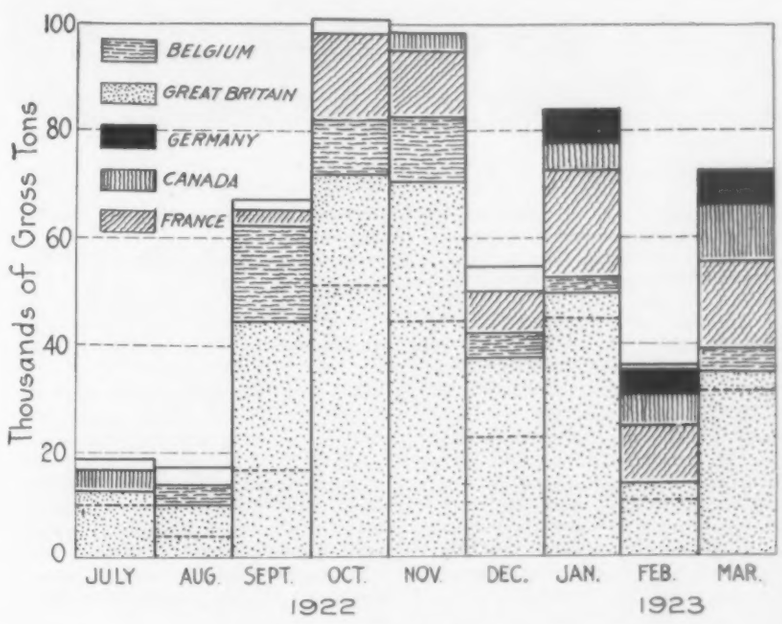
Planning Departments Inspected

A day was devoted to inspecting the planning department and the Cortland and Groton works of the Corona Typewriter Co. The plants are about 50 miles from Syracuse, and members and guests were transported by automobiles furnished by the company and others. Luncheon was served by the company in the Corona gymnasium at the Groton plant, the Corona band of 35 employees playing while the guests ate. Under the guidance of company executives every department of the plant was visited, after which the guests formed in groups in the gymnasium, where details of the company's planning methods, including time study and other related activities, were explained by executives in charge of those activities. There was a large attendance in spite of the rainy weather. An outline of the organization and production control methods of the Corona company was given by its works manager, Percy S. Brown, at the Nov. 22, 1922, meeting of the Taylor Society, which was reported in THE IRON AGE of Nov. 30, 1922. The company is manufacturing from 300 to 350 complete machines per day and has at present about 600 employees.

At the plant of the H. H. Franklin Co., Syracuse, in addition to inspecting the plant as a whole, the guests were given a demonstration of the working of the control board, devised by George D. Babcock, former production manager. Details of the planning of a given number of cars for a given period were set up, and the operation of the system was explained by R. G. Scott, assistant production manager of the company. The board and its operation are practically the same as described by Mr. Babcock in THE IRON AGE of Nov. 5, 1914, and also in his book on the subject. There are thirteen of these boards in use at present. The production of cars is now at the rate of about 60 per day, and the number of employees averages about 3000.

The firm of George W. Goethals & Co., consulting engineers, 40 Wall Street, has dissolved. General Goethals is now in business for himself as a consulting engineer, with offices at 40 Wall Street. The company still maintains offices at 150 Nassau Street and will continue to do so until various matters in its hands have been closed. Robert E. Graham, who was vice-president of the company, is at the Nassau Street offices.

The Great Pig Iron Inflow of 1922-1923



Graphic Representation of Pig Iron Imports

FINAL figures of the Department of Commerce show imports of pig iron in the nine months ended March 31 aggregating 549,118 gross tons. The seven months from Sept. 1 to March 31 provided an inflow of 513,185 tons, an average of 73,313 tons per month. The highest month (on the face of the returns) was 120,779 tons for October. As this included the last nine days in September, the imports in October alone were probably very close to 100,000 tons.

In the diagram the monthly imports for the nine months are shown, together with the countries from which the greatest amounts came. Blank space at top of each month indicates scattering amounts from countries sending less than 3000 tons. In the space devoted to Great Britain, the dotted line separates imports from England (below) from those emanating from Scotland (above the dotted line.)

Imports of Pig Iron into the United States

(Gross Tons)

Source	1922 July	Aug.	Sept. 1 to 21	Oct.*	Nov.	1922 Dec.	1923 Jan.	Feb.	March	Nine Months	Estimated for Calendar Months Sept.	Oct.
England	9,998	3,975	11,471	56,536	44,531	22,582	44,816	10,710	30,958	235,577	19,000	49,007
Scotland	2,750	6,050	19,600	28,715	25,993	14,635	4,951	3,100	3,870	109,664	25,500	22,815
Great Britain	12,748	10,025	31,071	85,251	70,524	37,217	49,767	13,810	34,828	345,241	44,500	71,822
France	400	1,854	2,100	17,017	12,548	7,770	19,974	10,744	16,566	88,973	3,000	16,117
Belgium	766	3,788	12,448	15,777	11,875	4,760	2,964	700	4,104	57,182	17,800	10,225
Canada	4,064	846	1,191	2,134	3,818	942	5,037	5,928	10,455	34,385	1,571	1,754
Germany	150	....	....	500	....	2,094	6,138	4,242	6,091	19,215	....	500
All other	700	592	29	100	2	1,945	55	399	300	4,122	29	100
Total	18,828	17,105	46,839	120,779	98,767	54,728	83,935	35,793	72,344	549,118	66,900	100,718

*Including last 9 days of September.

MIDVALE OPERATIONS

New Company Turning Out Numerous Products—Dr. Frevert in Charge

The recently organized Midvale Co., Philadelphia, successor to the Midvale Steel Co., is operating its various departments on a fair schedule in the production of forgings, tires, large and small rings, roll shells, large crank shafts, hardened ground rolls, special designs of extrusion cylinders and liners, piston and hammer rods, and forged members to withstand shock and fatigue. It is also producing, as a special product, large quantities of iron and steel castings, rough and machined, for nearby industries. There is an active increase in its business of carbon and high speed tool steels, and its purpose is to expand its tool steel output in the near future to include all analyses and sizes.

The company was the pioneer locomotive tire manufacturer in the United States. The equipment consists of four mills. These mills have a combined capacity of 12,000 tires per month, including plain, flanged and double flanged sections, from a minimum inside diameter of 13½ in. to the largest high speed passenger locomotive driving tires.

Large forgings, hollow as well as solid, will continue to be one of the chief products of the company. It is equipped to meet any requirements in this field, having 10 hydraulic forging presses ranging from 10,000 to 500 tons in capacity. The 10,000-ton press will handle a 175-ton ingot and will take a 14-foot forging between columns. To serve the forging presses, the plant is equipped with 10 open-hearth furnaces, of which seven are 50 to 60 tons, two 35 tons, and one 25 tons capacity. These furnaces are provided with a complete equipment of special ingot molds to produce ingots ranging in size from 1,000 to 350,000 lb. There is also a 6-ton Heroult electric furnace used for making the highest quality of electric steel either from cold scrap, or from metal melted in the open hearth.

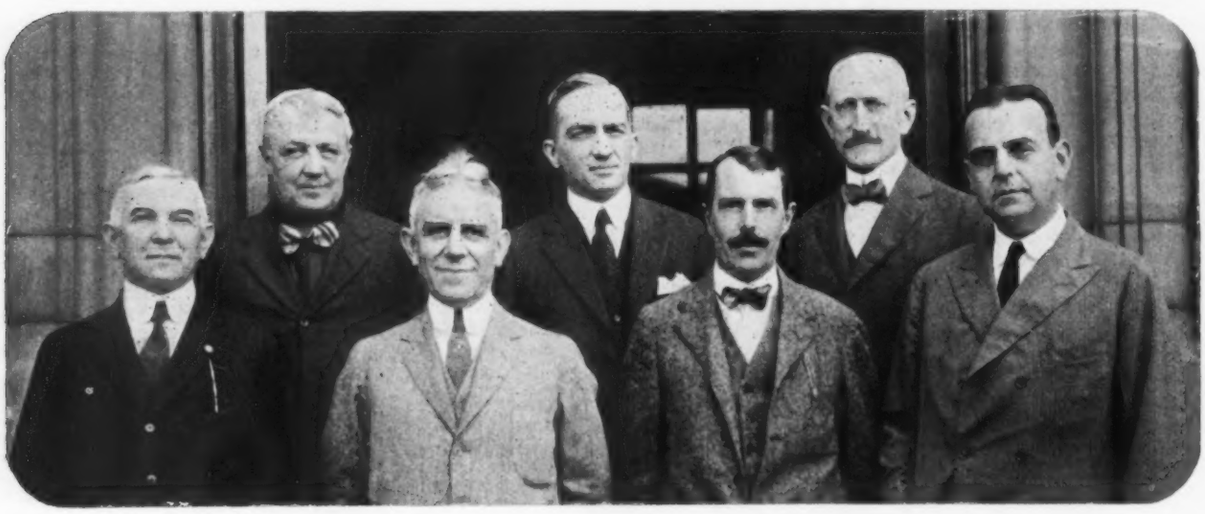
The Midvale Co. specializes in the production not only of large and unusual forgings, but in producing them in any grade of steel, or to any specification required. This plant, famous internationally for many years for its achievements in producing special and alloy steels, retains its old organization trained at Midvale and in control of its various departments for many years. Thus the skill and facilities which were developed to the highest extent in meeting special requirements in steel for armor plate and guns for various Governments is available for commercial work.

In charge of the plant is Dr. H. L. Frevert, who started with Midvale about 15 years ago, after graduating from Harvard University. In addition to the other departments, the Midvale Co. continues to conduct its important research work under the supervision of Dr. Frevert and John Lyman Cox. Midvale thus continues in a position to cooperate with the engineering departments of builders of large units of various kinds in meeting new and special forging requirements.

The Midvale plant, in addition to the steel works, forge and hammer shops, and rolling mills, has eight large machine shops. These include one tire machine shop, a slicing shop, two roughing shops and four shops for general finished machined work. In addition to previously mentioned units, the Midvale Co. has iron, steel and brass foundries. These foundries are utilized principally for the production of large castings to go along with forgings.

No decision yet has been made as to just what will be done with the special equipment for making armor plate and guns, and armor piercing projectiles. The company hesitates to scrap this equipment on account of Midvale's long standing preeminence in work of this character.

In addition to other appointments previously announced in THE IRON AGE, the Midvale Co. now has completed its organization by electing the following officers and directors:—Alva C. Dinkey, president; Dr. Harry L. Frevert, vice-president; James M. Milliken, secretary and treasurer; Stuart Hazlewood, vice-president in charge of sales; J. Rutherford McAllister, president Franklin National Bank; Samuel F. Pryor, New York; Samuel M. Vauclain, president Baldwin Locomotive Works, and Joseph Wayne, Jr., president Girard National Bank.



Officials and Superintendents of the Midvale Co.

Front Row—Left to right: A. C. Dinkey, president; J. M. Milliken, secretary and treasurer; Francis Bradley, general superintendent; Dr. H. L. Frevert, vice-president in charge of operations.
Back Row—Left to right: Radclyffe Furness, superintendent melting and forge; Stuart Hazlewood, vice-president in charge of sales; John L. Cox, assistant to general superintendent.

Bibliography of Petroleum and Allied Substances in 1919 and 1920

Under the above title the Bureau of Mines of the Department of the Interior has issued a 374-page book covering 4532 titles, arranged in accordance with the general grouping of the decimal system and followed by more than 40 pages of index. This is the fifth in the series of petroleum bibliography, previous compilations having been made for the years 1915, 1916, 1917 and 1918 individually. The work was edited by E. H. Burroughs and may be obtained from the superintendent of documents, Government Printing Office. Washington, for 40c.

Basing Point Hearing Held at Pittsburgh

Executives of Independent Companies Testify Concerning Customs Relating to Prices—No Agreements Since the Gary Dinners

PRESENTATION of the side of the United States Steel Corporation in the so-called Pittsburgh basing point case, in which the corporation is named as defendant in a complaint of the Federal Trade Commission, was resumed in Pittsburgh, June 6, in William Penn Hotel. As more than 40 witnesses, chiefly sales executives of independent steel companies in Pittsburgh and nearby districts will testify, it is probable that the hearing in Pittsburgh will take 10 days or two weeks. A hearing in Detroit will follow the one in Pittsburgh.

W. W. Corlett, counsel for the Steel Corporation, has endeavored in the present hearing, as in the one in New York, noted in THE IRON AGE, May 31, 1923, page 1576, to establish that there are times when there is a deficiency of steel in the Chicago district, which must be made good by shipments from other districts; that there is no agreement among steel manufacturers as to prices or the Pittsburgh basing point practice, and that on the contrary, there is usually sufficient competition between mills to cause considerable variation in the prices quoted by the different producers. In support of the effort to establish the deficiency in the Chicago supply, Mr. Corlett has offered compilations of the shipments into the Chicago district, as well as into California, Nevada, Washington and Oregon of the companies represented by witnesses at the hearing. These exhibits have been accepted by Examiner John W. Bennett of the Federal Trade Commission, but with the objections of counsel for the commission noted. Karl Steinhauer, counsel for the commission, has based his objection to the admission of these figures chiefly on the ground that they include shipments to jobbers and that the figures do not show the final disposition of such shipments.

Customs as to Prices

Witnesses have been questioned pretty exhaustively as to how their companies established prices and once established as to how and when they were changed. It was brought out that some companies vest the sales manager with authority to change prices, but with others, the matter had to be considered by a conference of the officials, and that with still others, even district sales agents had much latitude in the matter of meeting competition. The usual explanation for variations from the recognized regular market prices was the condition of the order book of the individual mill. If it was well filled, the attempt was made to secure an advance, while conversely, if it was necessary to fill it, prices were reduced to a point sufficient to bring about such a result. Examiner Bennett secured the admission from several witnesses that in spite of price variations, the great bulk of the shipments over a period of years was at about on a price parity from all mills. The usual answer to the query as to why manufacturers sought so many districts to dispose of their products was a desire to avoid dull periods which would result from confining business to a few points. Employment of the term, Pittsburgh rate of freight to destination, or its equivalent, several witnesses admitted in cross examination, meant a lower net mill price east or west, according to location of the plant. A question as to why a mill with a favorable rate west did not ship entirely in that direction and cut the price accordingly, was answered by one witness that the cut would be met by others.

Mr. Kennedy's Testimony

L. F. Kennedy, general manager of sales, West Penn Steel Co., Brackenridge, Pa., was the first witness called on Wednesday morning, June 6. He said in direct examination, that his company being a manufacturer chiefly of special finishes of sheets, had little competition in the Chicago district, as sheets of that class are not produced in that district. Prices of his company were established at a conference of company officials, but they can be varied to meet conditions without consultation with other officials and also district sales agents had wide discretionary powers about meeting price competition. In cross-examination, he disclaimed knowledge that presidents of companies producing sheets met for the purpose of fixing prices. Questioned about the bulletin service of the National Association of Sheet and Tin Plate Manufacturers, Mr. Kennedy asserted that this was more of a tonnage than a price report, and it was his belief that all companies did not report all sales and prices. He denied knowledge of a standard set of extras, observed by all sheet makers, claiming that those of his own company were different from others and that there were variations of $2 to $3 a ton in the extras charged by different companies. M. C. Bair, auditor West Penn Steel Co., affirmed figures of sheet shipments into the Chicago district, which were offered by counsel for the Steel Corporation.

Charles H. Forster, treasurer Superior Steel Corporation, Pittsburgh, on direct examination testified along the lines of the previous witness. He said that prices of his company were sometimes above and at other times below those of competitors. Asked how he knew of a variation between the prices of his own and other companies, he asserted that either he or some official or agent of the company had seen the order, contract or quotation of competitors, it being a company policy to have tangible evidence of a cut price before meeting it. He cited a number of specific cases in which he had found prices of competitors to have been different than those of his company. Figures of shipments into the Chicago district by the company prepared under Mr. Forster's supervision were offered by Mr. Corlett.

John F. Hazen, general manager of sales, Pittsburgh Steel Co., Pittsburgh, was next called. He said that departures from quoted prices were exceptional on the products of his company—wire products and hoops, bands and cotton ties. His company follows the plan of selling f.o.b. mill, plus freight from Pittsburgh to destination, he said, and admitted in cross examination that this plan netted a certain result at the mill on all shipments.

"Not Since the Gary Dinners"

Much interesting testimony was given by E. R. Crawford, president McKeesport Tin Plate Co., McKeesport, Pa., first witness on Thursday, who created laughter when in answer to a question as to whether there were agreements between manufacturers on prices, replied, "Not in recent years; not since the Gary dinners." He explained the reasons why makers of tin plate followed the practice of selling as much as six and even nine months in advance of requirements by saying that it was necessary for container manufacturers to know the cost of their tin plate and that the latter must make up cans well ahead of the demand for them. He said it was necessary to be on a price parity with other makers, since coke tin plate, which forms 90 per cent of the total production, is made the same by all makers. There were many instances of departures from the quoted price, he said. In 1921, when business was slow and his plant was facing a shutdown, he found it necessary to offer price inducements to get enough business and went down to $4.50 a base box, as against $4.75, the then current published price, and in the early part of 1922 he had taken business as low as $4. Such concessions, however, were made without disturbing the "regular" price, since to have done so would have necessitated marking down contract prices.

Business had been accepted in all territories at the lower prices during the depression, and Chicago benefited with other districts. He said that all manufacturers had practically the same price at all times in the past 25 years, but denied there was any agreement on prices or basing point, or that buyers were guaranteed against a decline. Mr. Crawford stated that competition was fair and there was no concession for advantage of location.

J. J. Watson, general manager of sales, Weirton Steel Co., Weirton, W. Va., who followed Mr. Crawford, said his company, when business was poor and wanted business, did not hesitate about quoting less than the going market prices and that what might be considered irregular customers of the company usually got the benefit of such price concessions. Prices of various manufacturers of strips and tin plate, the products of his company, he admitted to Examiner Bennett, were close to parity over a period of years on the bulk of the tonnage.

U. K. Becker, secretary Superior Sheet Steel Co., Canton, Ohio, was the last witness on Thursday, and admitted under examination by counsel for the commission that on account of the freight advantage, shipments West netted more than those to the East.

Rates to Wheeling District

W. H. Abbott, vice-president Whitaker-Glessner Co., in charge of sales, said that freight rates from the Wheeling district, in which most of the company's plants are located, are practically the same to all parts of the country as those from Pittsburgh. He added, however, that the company's Portsmouth, Ohio, plant had a freight advantage on shipments West. Customers were not given the option of putting business at a particular plant of the company. Witness said that his company used the American Sheet & Tin Plate Co. rate book, although not exclusively, since it maintained its own traffic department. He defended the practice of quoting f.o.b. Pittsburgh, or f.o.b. mill, freight added from Pittsburgh, on the ground of its convenience developed from long practice, and the savings effected. Touching upon competition, witness stated that his company had little in the Chicago district on a number of products, since none of the mills there made automobile and furniture sheets.

The Youngstown Practice

That it was the practice of Youngstown district sheet manufacturers to quote f.o.b. Youngstown, on shipments within that district, was testified by Harry T. Gilbert, vice-president in charge of sales and purchases Sharon Steel Hoop Co., Sharon, Pa. His company, Mr. Gilbert said, quoted f.o.b. mill, with freight equalized with Pittsburgh, in all other cases. Prices of sheets varied more than any other steel product, he declared, but added that the scientific knowledge acquired by buyers in recent years as to their requirements had made it difficult for one mill to obtain more than another in ordinary markets. He noted considerable difficulty in determining actual prices in a dull market. Only about 3 or 4 per cent of the company's sheets went into the Chicago district, but of its output of strips, that district took approximately 25 per cent.

H. D. Miller, secretary Otis Steel Co., Cleveland, and James A. Carr, vice-president Allegheny Steel Co., Brackenridge, Pa., were last witnesses Friday afternoon.

G. W. Hannan, president, and John F. Kraft, vice-president Washington Tin Plate Co., Washington, Pa.; Fred W. Beach, general sales manager, and Samuel Davey, vice-president and general manager Mansfield Sheet & Tin Plate Co., Mansfield, Ohio; W. M. McFate, vice-president Trumbull Steel Co., Warren, Ohio; Claude Stafford, Follansbee Bros. Co., Pittsburgh, and Floyd Booth, president Falcon Steel Co., Niles, Ohio, were witnesses at Monday's session and were examined along the lines of the previous witnesses.

FOREIGN TRADE NECESSARY

President Farrell Addresses Graduating Class of Georgetown University

WASHINGTON, June 12.—Addressing the graduating class of the Georgetown University School of Foreign Service here last Sunday night, President James A. Farrell of the United States Steel Corporation, chairman of the National Foreign Trade Council, declared that America can "no longer remain in a state of mental unpreparedness" either in international affairs or in foreign trade. Mr. Farrell expressed the view that continued well-being of the country and the happiness and prosperity of its people are dependent upon the successful development of foreign trade.

"Many of our people are laboring under the delusion that because we now hold a large part of the world's gold, that we can remain in this position indefinitely," said Mr. Farrell. "The very fact that we are a creditor nation works in many ways to our disadvantage. For one thing, it gives us a false sense of security and instead of spurring us to supreme efforts to overcome the handicap of debts, it induces us to relax our efforts and our vigilance where intelligent and persistent efforts are needed to retain the position in the trade of the world which we so recently and unexpectedly acquired.

"Many of our people, too, have developed the habit of deprecating our ability to compete with foreign interests in neutral fields. This is most clearly indicated perhaps in connection with shipping. This general lack of interest in foreign trade, this general self-deprecation in respect to banking, manufacturing, shipping, or other commercial activity, must be overcome if we are to assume a position befitting our resources and our abilities as compared with competitor nations."

The speaker told members of the graduating class that the university's school of foreign service appealed to him with particular interest. He said that he had long felt "the pressing need for a school where youth could be given that preparation which befits men whose work will be cast abroad as representatives of our Government or as representatives of our American industries and business interests."

At this time in the history of our country there are indeed, more than at any time in the past, Mr. Farrell declared, men who have been trained in the fundamentals and can understand the intricate relationships both in public dealings with foreign governments and in private business dealings with the business interests and subjects of foreign nations.

Automobile Industry of Canada

Figures from the Ministry of Trade and Commerce, Ottawa, show that the 1922 automobile production from the 15 Canadian plants amounted to $81,956,429, compared with $67,050,209 in 1921 and $101,465,846 in 1920. Except for 1920, the 1922 figure is the highest on record. The number of cars produced was 87,263, compared with 62,549 in 1921 and with 89,543 in 1920. There were 7344 employees engaged in the business in 1922, compared with 5475 in 1921 and 8281 in 1920.

An interesting feature of the report is an accounting for the number of automobiles scrapped or withdrawn from use in Canada during the past two years. This is obtained by adding together the previous year's number of licenses, the cars manufactured and the imports, and then deducting the total of the new year's licenses and the exports. Thus, in 1922, the 1921 licenses of 455,761 cars, together with the manufactures and imported cars, made a total of 568,359. The 1922 licenses, 505,308, added to the exports, made a total of 543,634. The difference between these two figures is 24,825, and represents the number which had disappeared. This, it will be noted, is about 5½ per cent of the number of licenses in 1921.

Good Record Being Made by the Railroads

Government Officials Highly Pleased by Showing—Successful Efforts of Carriers Regarded as Best Protection from Radical Legislation

BY L. W. MOFFETT

WASHINGTON, June 12.—Striking performance of the railroads is a source of particular gratification to Government officials associated with departments which are charged with the task of keeping in intimate touch with the transportation, commercial and financial situation of the country. Like other institutions, the railroads face a labor shortage. They are not as yet getting satisfactory net returns on their investment, but have developed marked improvement in this direction. Although they still require more equipment, both in the way of rolling stock and added terminal facilities, the efficiency of the transportation machine has been so greatly improved that, according to a statement of the Car Service Division of the American Railway Association in 1922, Class I railroads handled 19.2 per cent more revenue freight, measured in net ton miles, with 9.5 per cent less freight train miles than in 1914. In 1921 the performance was 7.7 per cent more freight traffic than in 1914 with 13.5 per cent less train miles.

Up to May 19 this year the total number of freight cars loaded was 18,021,743, as compared with 15,059,800 for the corresponding period of 1922 and 14,082,546 for the corresponding period of 1921. Also, during the week ended May 26, a new high record for this time of year in the number of cars loaded with revenue freight was made, the total having been 1,014,029 cars.

Heavy Loading of Ore

The principal increase over the week before was in the loading of iron ore, the total for which was 67,057 cars. This was not only an increase of 7438 over the preceding week, but was an increase of 50,426 cars over the same week last year and an increase of 37,227 cars over the same week in 1921. Coal loading totaled 181,589 cars, 6441 in excess of the preceding week. Compared with the same week last year, when, however, the miners' strike was in progress, this was an increase of 100,143 cars, and was an increase of 20,967 cars over the corresponding week in 1921. Forest products, grain and grain products, and live stock also showed increases. The heavy loadings reveal the high state of activity of the basic lines of industry, including iron and steel, as well as the smaller lines, including the retail trade. They also reflect the heavy movement of live stock and a substantial movement of grain and grain products. Yet despite the great demand being made on the railroads, not only are there no reports of congestion, but statistics show that the loading of revenue freight for the week of May 19 was only 2.5 per cent under the greatest week in the history, and at the same time reports filed by the carriers show a still further decrease in car shortage with an increase in the number of surplus freight cars in good repair.

Shortage of Freight Cars

The total shortage in freight cars on May 22 was 20,585, which was a decrease of 3176 since May 14, while the total surplus freight cars in good repair was 22,700, or an increase of 4281 within the same period. This is the first time since Sept. 1, 1922, that the number of surplus freight cars has exceeded the car shortage. Shortage in box cars on May 22 amounted to only 3973, a decrease since May 14 of 1555, while shortage in coal cars totaled 14,620, a decrease of 1033 within the same period. Shortage in all other classes of equipment has, however, entirely disappeared. Surplus box cars in good repair and immediately available for service totaled 9084 on May 22, an increase of 2807 in approximately a week, while surplus coal cars totaled 2775, which was only one car less than on May 14.

The railroads on May 15 not only had more serviceable locomotives than ever before since the Car Service Division began the compilation of its locomotive records in August, 1920, but there were likewise fewer locomotives in need of repair than ever before during the same period. It is even shown that on May 15 there were 1376 serviceable locomotives in storage and available for use when traffic conditions warrant. This was an increase of 50 locomotives over the number in storage on May 1.

Serviceable locomotives on May 15 totaled 50,587, an increase of 328 over the total number on May 1, this year, which had previously marked the peak. Locomotives in need of repair on May 15 totaled 13,495, or 21 per cent of the number on line. Compared with the number on May 1, this was a decrease of 636. Locomotives awaiting heavy repair totaled 12,183, or 19 per cent of the number on line, compared with 12,473, or 19.4 per cent on May 1, or a difference of 290 locomotives. Under the program unanimously adopted at a meeting of the railroads in April in New York, the number of locomotives awaiting heavy repair is to be reduced by Oct. 1, next, to 15 per cent.

New Rolling Stock

The railroads of the United States from May 1 to May 15, this year, installed 5633 new cars and 308 new locomotives. This brought the total number of new freight cars installed since Jan. 1 to 55,784, while a total of 1536 new locomotives has been placed in service during the same period. New freight cars on order on May 15 totaled 113,619. Of that number, box cars totaled 48,569; refrigerator cars, 14,228; coal cars, 45,742, and stock cars, 1925. During the first 15 days in May the carriers placed orders calling for the delivery of 147 new locomotives, which brought the total number on order on May 15 to 2103.

Testifying as the first witness for the carriers in the investigation as to the adequacy of railroad locomotives and cars, R. H. Aishton, president of the American Railway Association, told the Interstate Commerce Commission at the opening hearing on Monday of last week that, while the railroads have been accomplishing heavy loading, they have at the same time been bringing about a substantial relocation of closed equipment to the West and Northwest in anticipation of the crop movement this fall, and a substantial relocation of open top equipment from the West to the East. He said that from Jan. 1, 1922, to May 1, 1923, the railroads purchased 252,257 new freight cars, of which 136,501 already had been delivered, while on May 1, a total of 115,756 was on order. From March 15, 1923, to May 1, Mr. Aishton said 28,613 cars were ordered. During the 16 months period from Jan. 1, 1922, to May 1, 1923, the railroads purchased 4563 locomotives, of which 2607 had been installed, while 1956 were on order on May 1.

Large Expenditures

Tabulation of reports filed by the carriers show that in 1922 and 1923 the railroads have either actually expended or authorized expenditures amounting to $1,540,214,419 for new freight cars, locomotives, trackage and other facilities, according to Dr. J. H. Parmelee, director of the Bureau of Railway Economics, who followed Mr. Aishton. Of that amount, $923,020,201, or 60 per cent, was for equipment, while the

remaining $617,194,218, or 40 per cent, applied to tracks and other facilities. In 1922 alone, $431,542,115 was expended for new cars and locomotives, trackage and other facilities, of which amount, the witness said, $246,502,929, or about 57 per cent, represented additional equipment or improvements to equipment. In that year, approximately 72 per cent of the $246,502,929 was expended for freight train cars alone. The total for all purposes in 1923, Dr. Parmelee said, is approximately $1,108,672,304, of which amount 61 per cent, or $676,500,000, was for equipment, while 39 per cent, or $432,000,000, represented improvement to the road. Of the total authorization for equipment, he said, $415,000,000, or 61 per cent, was for freight train cars.

Protection Against Radicals

The splendid efforts made by the railroads, in the opinion of the students of the situation, if continued, will prove to be the best possible protection against hostile legislation. Constantly recurring reports about plans of radicals in Congress to either amend the transportation act adversely to the railroads or to seek outright Government ownership have created some apprehension. Perhaps it is agitation, rather than any actual fear that the purpose sought will be accomplished, that has been the source of the disturbance in railroad and industrial circles. It is felt that if the railroads maintain a higher degree of efficiency it will be hard, if not impossible, for politicians to arouse any interest among their constituents in favor of the pet hobbies of these radicals.

In this connection it is believed that the railroads themselves are making the best answer to the plea made by them to the United States Coal Commission in a report just filed, in which the railroads urge the adoption of a policy by the American people which will insure the railroads fair treatment and enable them to work out their problems without fear of action "of a confiscatory nature" for a time at least, as the press notice states. The report was filed by a special committee of the American Railway Association.

The report deals particularly with the coal situation and its members and the committee takes occasion to state that the task of the railroads to furnish transportation for the distribution of coal has been rendered difficult by certain features characterizing the production of coal. Nevertheless the report reflects courage and optimism on the part of the representatives of the carriers.

It is pointed out that the increased facilities that will be required by the railroads as the business of the country increases, cannot be procured without the expenditure of new capital and that the investing public will not be attracted to railroad securities unless there is a reasonable assurance that the investment is safe. It is at this point the commission is told that it is necessary for the American people to adopt a policy which will make it certain that the railroads "for a time at least will be free from the menace of hostile legislation." The report urges the necessity of the railroads to earn a fair return and also the freedom from strikes both in the coal and railroad industry.

Oil Burner for Low Temperature Ovens

A small capacity oil burner with heat distributing tube, which is essentially a low temperature attachment for ovens requiring relatively low heat, such as paint drying, core baking, japanning and others where the construction is light and little or no refractory lining is used, has been added to the line of the Anthony Co., 138

Small Capacity Oil Burner for Low Temperature, Direct or Indirect Ovens. It may be regulated to 1 pt. per hr.

West End Avenue, Long Island City, N. Y. The device is designed for duplicating heat conditions where gas through perforated pipes has been the only practical fuel. It is said to be applicable to any fuel oil system and for either direct or indirect heat ovens. It may be regulated from 1 pt. per hr. and oil and air pressures from 100 lb. down to ½ lb. may be used. It is intended to handle any grade of oil, and use steam as well as air. It operates with either gas or oil.

The burner used is the company's Nebulyte type P. It is equipped with an oil scrubber, and oil and air stop valves. A small refractory combustion chamber, forming the entrance to the heat diffusing and distributing tube, is located at the burner outlet and held in position by a removable cast iron casing. The metal tube incloses the small flame and is said to eliminate radiant heat from the oven walls or material in process, and provide suitable orifices along the top or sides for passage of hot gases. It is supported by a flange, which may be attached rigidly to the ovens or left removable.

The unit being designed to duplicate the heating effect of a multiplicity of gas jets, it is applied accordingly. In small ovens it is usually placed in the center, at the bottom, and in larger ovens two or more are applied, corresponding to the usual location of the jets. In no case, it is emphasized, are they to be applied to ovens where the oil consumption exceeds 1 gal. per hr.

The application of the burner unit is shown in the illustration. The heat-distributing tubes are available in lengths from 2 to 6 ft. to suit oven depths of 3 to 8 ft. The outlets for hot gases are located along the top or sides, depending upon the direction of the throw desired. For isolated ovens, where oil and air are not available, a small storage tank, equipped with a self-contained motor-driven oil pump and blower unit, may be employed.

Electric Equipment for Ford Rolling Mills

An alternating current motor of no less than 8000 hp. capacity is being designed by the General Electric Co. for use at the River Rouge plant of the Ford Motor Co., for driving a blooming mill. Alloy steel is expected to be the principal product of the Ford steel mills, which will include a merchant mill to be driven by a 4500-hp. direct-current motor, supplied from four 2000-kw. motor-generator sets.

Ultimately it is expected that this plant will expand its production to make substantially all the steels which goes into the Ford car. The General Electric Co. reports a recent order from the Ford Motor Co. covering fifteen 1500-kw. motor-generator sets, three 10,000-kva. auto-transformers and 44 mill motors, ranging in size from 4 hp. to 100 hp.

Benson furnace at the Rouge plant of the Ford Motor Co. in May made a new high record for the low consumption of coke, averaging 1906 lb. per ton of iron. The average tonnage of iron was 524 tons per day, with the silicon 3.25 per cent and the sulphur 0.026 per cent.

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ESTABLISHED 1855

THE IRON AGE

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Conserving Prosperity

Many proposals are being made, the immediate object of which is the conservation of our present prosperity, while the general object is to smooth out the curve of business activity so that severe depressions may be avoided. An interesting collection of suggestions was made, for instance, at the annual meeting in New York last week of the National Monetary Association.

It is not an established fact that all business men desire that business should proceed along a straight line without any ups and downs. What men say would suggest that such a desire is universal, but what men say is not final and conclusive. Some sentiments in the human mind are naturally expressed freely. Others are often suppressed, so far at least as words go. Undoubtedly the great majority do desire stability, or feel convinced that they do.

It is a hopeful thing that in these times of activity and of mixed prosperity there is this discussion of ways and means to stabilize business. In the recent depression we heard much of the subject, but it is one thing to want to be well when sick and another thing to make a serious effort when well to avoid a recurrence of sickness.

All remedies or influences proposed should receive respectful consideration, but there is one general rule that should be recognized in all studies, and that is that business is conducted by individuals, possessed of minds that work in their own way. The psychology of business is of prime importance. Business can be controlled best by influencing the minds of business men, while the least promising methods are those that look to the application of force.

Education, in other words, offers a promising route. In this respect the survey of business conducted by the Department of Commerce is a well-planned activity. All education of individuals in economics is good.

An analysis of the present business and economic situation illustrates the point. The men who know most of business and economics are exhibiting the best conduct. The high cost of building is very generally mentioned as an unsafe feature of present conditions, and it is easily recognized that in building one finds many spenders who are not versed in business and have no knowledge of economics. The best educated are conducting themselves best and such danger as is discerned is created by men who are not educated in this respect.

What is here urged is education of business men. The notion so often held, that workmen or wage earners can be educated in such manner as to make business activity and employment uniform, must be viewed with some doubt. Wherever there is a recipient of wages there is a payer of wages. It is asking rather much to expect the workman to stick to his employment and not accept a bribe to go elsewhere. Whether or not such an end might be considered desirable, there is no science of economics the teaching of which would bring it about.

Coal Prices Are Moderate

It may be a true word spoken in jest, that the reason bituminous coal is now selling at very moderate prices is that it is nine months since the last strike and nine months before there can be another.

Merely by comparison with pre-war prices, or indeed with prices ruling prior to the latter part of 1916, coal is rather high, but other commodities also are high by the same comparison. Relative to prices ruling from late in 1916 until Government control was imposed, and to prices ruling during a large part of 1920, as well as to prices during last year's strike, coal is very cheap. In each of those three periods spot coal went above $5, and for a few weeks in 1920 it was above $10.

In relation to cost of production coal is selling at a low rate in practically all districts. For this there is not simply the testimony of operators, but the opinion also of large consumers who make it a point to be posted on coal mining conditions. Some coal producers are probably making good sized profits, but they are largely sellers who were lucky or far-sighted in making contracts. The average or typical operator, who is dependent on the spot or prompt market as an outlet, is probably merely avoiding the losses he would have, in overhead and mine maintenance, in closing down entirely.

Yet the demand for coal is all that could be expected. The industries of the country are operating

at the greatest rate of which they are capable. The railroads are at practically their record rate in freight and passenger service. Domestic coal is out of season but the Northwest is stocking up.

While coal is very high relative to pre-war standards, the employees are getting all the benefit of the high prices. Unquestionably the operators are worse off, as to profits, than they would be if the wage scale were considerably lower, for there is the outstanding fact that of all classes of employers the coal operators have today the best labor supply. The general experience of all the past has been that in periods of industrial activity the coal industry has more or less labor shortage. Now it has practically none. There could be no more trustworthy evidence that coal mining wages are altogether too high relative to everything else.

The coal industry is one of contradictions. It does not follow the simple economic laws that are expected to govern business in general and do govern most lines of industry. For many months we have had to sit and listen, patiently if we could, to the argument that coal prices must necessarily be high because coal mining is greatly overdeveloped, so that the industry has a high overhead. The principle thus invoked is that the greater the productive capacity for a commodity the more the public must pay for the commodity. Now we see the condition of coal being cheap and plentiful because the cost of production is very high.

While the Connellsville coke region is non-union, it has wage rates related to the union coal mining scale, and its experience is in line with that of the union coal mines. The Connellsville region often has had labor shortage when the iron and steel industry was not so active as it is at present, but now the Connellsville region has no labor shortage. The liquidation in Connellsville coke prices has come later than the liquidation in coal prices, but it has come. For several weeks spot furnace coke has been in the neighborhood of $5, and lately a third quarter market has been developed around $5.50. These prices are very high compared with pre-war times but they are not out of line with the wage scale.

Manufactured Imports Less

Analysis of Department of Commerce figures shows that during the eight months ended Feb. 28 in the current fiscal year there were imported 458 million dollars of manufactures ready for consumption out of a total of 2327 million dollars. This represents 19.7 per cent. Compared with these figures, the imports for the corresponding period in the 1922 fiscal year showed 412 million dollars of manufactures ready for consumption out of a total of 1622 million dollars, or 25.4 per cent. Further evidence of the increasing proportion of unmanufactured materials in the imports is afforded by the figures for crude materials for use in manufacturing, which in the 1923 period amounted to 926 million dollars, or 39.8 per cent of the total, compared with 573 million dollars and 35.4 per cent of the total in the previous year. Partly manufactured goods designed for further use in manufacturing show 438 million dollars in the current period, or 18.8 per cent of the total, compared with 240 million dollars in the earlier period, or 14.8 per cent of the total. Summing up, the crude materials and partly manufactured materials, to feed the manufacturing industries of the United States, aggregated in the current year 58.6 per cent of the total imports, compared with only 50.2 per cent in the previous year.

Changes in German Steel Practice

Definite information concerning the changes which have been necessary in Germany's steel-making processes as a result of the war is now available. A detailed comparison of 1920 with pre-war years, as made by *Stahl und Eisen*, shows two striking developments.

The most marked technical change is in the production of steel ingots. With the territorial basis for comparing the same, the following table, giving the percentage of steel ingot output by processes in pre-war and post-war years, shows what has been going on:

	1908	1913	1919	1920
Basic Bessemer.....	58.5	54.5	35.5	33.1
Acid Bessemer.....	1.6	0.9	0.6	0.6
Basic open-hearth.....	37.7	42.0	61.6	64.1
Acid open-hearth.....	1.4	1.7	0.9	0.9
Electric steel.....	0.1	0.4	0.8	0.9
Crucible steel.....	0.7	0.5	0.6	0.4

Prior to the war, due to the use of minette ores, basic Bessemer steel made up the greater part of the output. After the loss of these ores the basic Bessemer was gradually displaced by the basic open-hearth. Were data available for 1922 the proportion would probably be still larger. Converters are being supplanted by open-hearth and electric furnaces, the output of the latter in 1920 being over 100 per cent more than in 1913. Another side light is the fact that Scandinavian iron ore has largely displaced French ore, the percentage of the former having been 50 per cent of the total in 1922 as compared with 32 per cent in 1913.

The greatly increased use of scrap is the second important change. For every 100 tons of pig iron made, 14.90 tons of scrap was used in 1920, as compared with only 1.24 tons in 1913 and 0.61 ton in 1908. While no data are given as to the use of scrap in steel plants, the importation of over 600,000 tons of scrap in 1922 is a clear indication of the trend, and of a larger use last year than in 1920.

The Germans are demonstrating on a large scale that it is possible to adapt a huge steel industry to new conditions, and that good pig iron and steel can be made from large charges of scrap. There is the further consideration that these changes mean production at a lower cost and hence offering keener competition to British and American steel when economic conditions are nearer normal and international relations more settled.

A feature of the copper export movement to which attention has not been called and which has assumed large proportions is that of finished copper, particularly rods. In the first quarter of this year the exports of rods reached over 6,429,000 lb. per

month, as compared with only 4,349,000 lb. per month in the year 1922 and less in 1921. In copper pipes and tubes and in plates and sheets purchases by foreign consumers have also been on a very large scale. Great Britain has taken nearly 50 per cent of the copper rods, and Canada and Denmark are the next largest purchasers. In contrast, the exports of refined copper for the last nine months have been less than in the same period a year ago, while those for rods have more than doubled. The significance of this movement in finished copper products lies in the fact that it is probably cheaper to produce these products and ship them to other countries in the finished form than it formerly was to produce them in those countries from the virgin metal. Taken together, the exports of refined copper and of finished copper have grown to proportions which are now larger than in any previous recent movement. They emphasize the importance of the American copper industry in our foreign trade balance.

The progress that is being made in heat treatment in the steel foundry was emphasized by two papers presented at the Cleveland convention of American foundrymen last month. One, "The Heat Treatment of Steel Castings," discussed the results possible from a carefully planned process as applied to carbon castings, while the other, "Heat Treatment of Alloy Steel Castings," dealt with chrome-nickel castings. The first paper is an excellent example of research as conducted on broad lines by the Electric Steel Founders' Research Group, and shows a sharp contrast between what can be done with carbon castings now and the possibilities of the crude methods of only a few years ago. The second paper demonstrated some of the superior physical properties obtainable from properly treated alloy castings. It indicated that the demand for these special steels is rapidly increasing and that it is well worth the founder's time to investigate the problems involved in their treatment. The application of modern principles of heat treatment to all grades of steel castings is producing some notable results. One effect is the removal of the prejudice against steel castings which once existed, partly because of inferior work following the operation of casting. Another is the expanding demand, particularly for alloy castings, in competition with some descriptions of steel forgings.

CORRESPONDENCE

Centrifugal Casting

To the Editor:—May I point out a passage in the report in THE IRON AGE, May 10, page 1333, on my paper on "Centrifugal Casting" before the American Foundrymen's Association which I believe is incorrect. This deals with the matter of warping of molds. What I actually said was that some trouble was encountered wth split molds which were used during the experimental period, and that because of this and for other reasons *only solid molds* are used in tube casting.

Further, the formula for steel casting is not correct: It should read 1650/VR.

L. CAMMEN.

New York, May 28, 1923.

New Books Received

Practical Perspective. By Frank Richards and Fred H. Colvin. Pages 117, 4½ x 7 in.; illustrations 68. Published by the Norman W. Henley Publishing Co., 2 West Forty-fifth Street, New York. Price, $1.

The Journal of the Iron and Steel Institute. Subject and name index to volumes for years 1911 to 1921 and to Volumes III to X of the Carnegie Scholarship Memoirs. Pages 538, 5¼ x 8¼ in. Published by the Iron and Steel Institute, 28 Victoria Street, London, S. W. 1, England, and Spon & Chamberlain, 123 Liberty Street, New York.

Transactions of the American Institute of Mining and Metallurgical Engineers for 1922. Pages 1209, 6 x 9 in. Published by the American Institute of Mining and Metallurgical Engineers, Inc., 29 West Thirty-ninth Street, New York.

Financial and Operating Ratios in Management. By James H. Bliss. Pages 396, 6 x 8¾ in. Published by the Ronald Press Co., 20 Vesey Street, New York. Price, $6.

Metals and Metallic Compounds. By Ulick R. Evans. Published by Longmans, Green & Co., 55 Fifth Avenue, New York. Volume 1, Introduction, Metallography, Electro-Chemistry. Pages 468, 5¼ x 8½ in.; illustrations 91. Price, $7. Volume II, Metals of the A Groups. Pages 396, 5¼ x 8½ in.; illustrations 19. Price, $6.

Elements of Machine Design. By Dexter S. Kimball and John H. Barr. Second edition; pages 446, 6 x 9 in.; illustrations 120. Published by John Wiley & Sons, Inc., 432 Fourth Avenue, New York. Price, $4.

A Symbol of Safety. An intepretative study of a notable institution organized for service—not profit. (Underwriters' Laboratories, Inc.) By Harry Chase Brearley. Pages 290, 6 x 9 in.; illustrated. Published by Doubleday, Page & Co. Price, $2.50.

Publicity. A Manual for the Use of Business, Civic or Social Service Organizations. By R. H. Wilder and K. L. Buell. Pages 271, 5 x 7 in. Published by the Ronald Press Co., 20 Vesey Street, New York. Price, $2.75.

Industrial History of the United States. By Edward S. Cowdrick. Pages 414, 5½ x 8½ in. Published by the Ronald Press Co., 20 Vesey Street, New York. Price, $2.75.

The Modern Iron Foundry. By Joseph G. Horner. Pages 255, 5¼ x 8 in.; 146 illustrations. Published by Oxford University Press, American Branch, 35 West Thirty-second Street, New York. Price, $5.

Scientific Management and the Engineering Situation. By Sir William Ashley. Pages 28, 5½ x 8½ in. Published by Oxford University Press, American Branch, 35 West Thirty-second Street, New York. Price, 35 cents.

The Mechanisms of Machine Tools. By Thomas R. Shaw. Pages 351, 8½ x 11 in.; 433 illustrations. Published by Oxford University Press, American Branch, 35 West Thirty-second Street, New York. Price, $14.

The Engineering Index, 1922. Pages 675, 6½ x 9 in. Published by the American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York. Price, $6.

Under the title "The Port of Boston," the National Shawmut Bank of that city has issued an attractive 52-page booklet, well illustrated and devoted to a history of the development of the port and a discussion of its present facilities for handling cargoes. The total movement of vessels in foreign trade entering the port in 1922 is reported at 4,289,416 gross tons. The port is nearly 200 miles nearer to Europe than is New York, with correspondingly greater advantages over Philadelphia and Baltimore. It contains the only drydock on the east coast of the United States capable of docking such vessels as the Leviathan and the Majestic. It is the center of one of the greatest fishing industries in the world and has had the advantage of a special State-financed development of the facilities of the port.

SHIPPERS' COMMITTEES

Representatives of Industries Will Cooperate with the Railroads

WASHINGTON, June 12.—Selection of special shippers' committees to cooperate with the railroads has been announced by the American Railroad Association. It is proposed to have these district committees work in conjunction with the district manager of the Car Service Division and other railroad officials.

A. S. Lucas, traffic manager, United States Cast Iron Pipe & Foundry Co., Birmingham, Ala., represents the iron and steel shippers on the executive committee for the Southeast. He is also chairman of the Iron and Steel Traffic Managers' Association. S. L. Yerkees of Birmingham represents the coal and coke shippers; in the Southwest A. P. Rudowsky traffic manager, Oklahoma Coal Operators' Association, of McAlester, Okla., is the chairman of the sub-committee on coal, coke and lignite. A. B. Currie of Omaha, Neb., is chairman of the standing committee on coal and petroleum for the Central Western District. Clyde M. Reed, chairman of the Kansas Public Utility Commission, is general chairman of the Shippers' Advisory Committee on the Trans-Missouri-Kansas Board.

Similar boards will be appointed within a few days in territories served by the Car Service Division at Toledo, Cincinnati, Chicago and New York.

It is pointed out that these boards are intended to serve branch offices as follows:

1. To form a common meeting ground between shippers, local railroads and the carriers as a whole, as represented by the Car Service Division, for the better mutual understanding of local and general transportation requirements, to analyze transportation needs in each territory and to assist in anticipating car requirements.

2. To study production, markets, distribution and trade channels of the commodities local to each district, with a view of effecting improvements in trade practices when related to transportation, and promoting a more even distribution of commodities where practicable.

3. To promote car and operating efficiency in connection with maximum loading and in the proper handling of cars by shippers and railroads.

4. To secure a proper understanding by the railroads of the transportation needs of shippers, that their regulations may fit shippers' requirements and, contrary, to secure understanding by the shippers and their cooperation in carrying out necessary rules governing car handling and car distribution.

5. To acquaint shippers and railroads in each section of the country of the seasonal requirements in their section, in order to promote intelligent cooperation in the handling of equipment between the different districts of the country.

6. To adjust informally car difficulties which may arise in each local territory between the carrier and shipper.

7. To give the shipping public a direct voice in the activities of the Car Service Division on all matters of mutual concern.

Campaign for Laborers

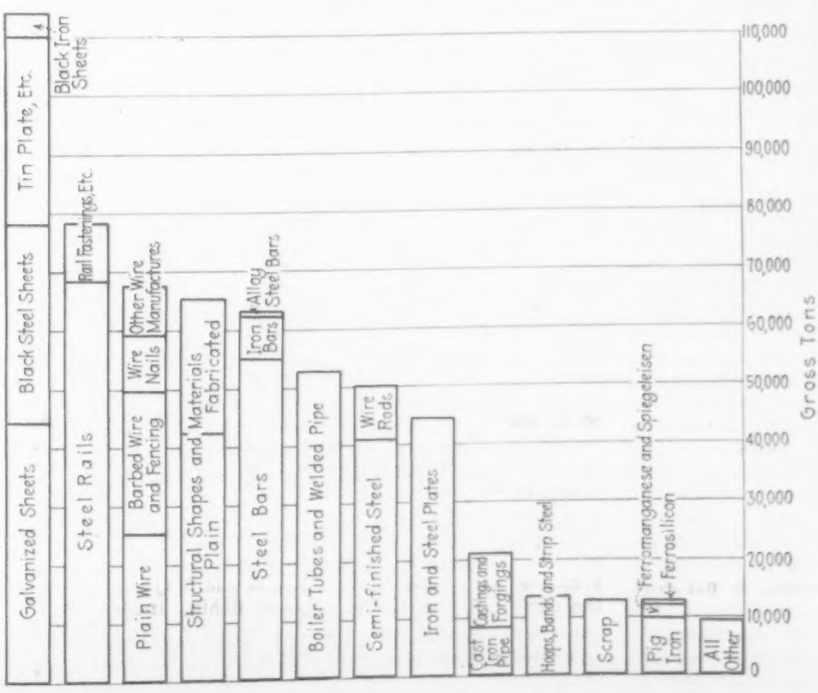
WASHINGTON, June 12.—Declaring that there never before has been such a demand for labor in the United States, and that anyone could get good wages, Rev. Simon P. W. Drew opened a campaign here yesterday by the White Cross Free Labor Bureau of America, of which he is president, for 50,000 white and colored laborers for steel plants, railroad yards and brick yards, etc., in the three States of Pennsylvania, New Jersey and Ohio.

FOUR MONTHS STEEL EXPORTS

Sheets and Tin Plate Lead, with Rails, Wire, Structural Material and Bars in the Next Four Positions

Figures of the Department of Commerce for the first four months of 1923 show a total of 604,409 gross tons of iron and steel exports from the United States, the figures for the four successive months having been 124,444 tons in January, 135,182 tons in February, 165,624 tons in March and 179,159 tons in April.

Sheets and tin plate accounted for a total of 113,748 tons; rails and rail fastenings amounted to 77,971 tons; wire and wire manufactures came to 67,216 tons; structural material, plain and fabricated, aggregated 65,260 tons; bars totaled 62,510 tons. The largest single item reported, disregarding the groupings above, was steel rails, with 68,047 tons. The fifteen greatest single items are included in the table, which covers all the items with 10,000 tons or more:



Steel rails	68,047
Steel bars	55,208
Boiler tube and welded pipe	52,421
Iron and steel plates	44,263
Galvanized sheets	44,059
Structural shapes, plain material	42,213
Ingots, blooms, billets, sheet bars and skelp	40,962
Black steel sheets	33,802
Tin plate, terne plate, etc.	31,921
Plain wire	25,405
Barbed wire and woven wire fencing	23,863
Structural materials, fabricated	23,047
Hoops, bands and strip steel	13,621
Scrap	13,047
Pig iron, not including ferro-alloys	10,037

Iron and Steel Exports from the United States in the First Four Months of 1923, by Major Groups of Commodities

STEEL PRICES HOLDING

Few Exceptions to the Rule in the Youngstown District

YOUNGSTOWN, June 12.—The Carnegie Steel Co. is reported sold ahead four to six months on steel bars, accounting for continued full operations of the Upper and Lower Union mills and the McDonald mills, in the Youngstown district. Independent bar orders are also reported heavy.

With few exceptions, steel prices are holding at nominal levels for third quarter requirements. Black sheets, however, are lower and indications are that some interests are accepting business at least $2 per ton below the nominal market of 3.85c. Makers point out that declining production due to weather conditions is a factor which will likely sustain prices in the sheet market during the summer.

The plate market is on a 60-day shipment basis, though in some cases deliveries as early as July are possible to obtain. The low price of crude oil, inducing refiners to stock, has created a substantial demand for tanks, which is being reflected in the plate market. In this district, the price remains firm at 2.50c. base.

Car repair interests are also absorbing their usual plate supplies, and in a number of instances have enough work booked to maintain operations over balance of the year.

In face of good demand, tin plate makers are predicting some shortage before the season ends. On bulk of the tonnage, a $5.50 price has applied, though on some small-lot business makers are still asking $6 per base box.

Independent strip makers continue their policy of limiting obligations to 60 days. In the hot strip market, deliveries are possible under 60 days with some mills, but shipments in a shorter time on cold-rolled are difficult to unearth. Producers report that there appears to be a well-sustained overhanging demand.

Wire products are freely sought, and makers are obligated three to four months ahead. Naturally, prices are firm.

Though oil field demand for line pipe and casing has materially subsided, nevertheless makers are still far behind in their deliveries and have months of business on their books. Standard steel pipe is still in heavy demand. Pipe stocks in hands of jobbers are reported unbalanced and low in many cases.

There is firmer demand for blue annealed and galvanized sheets than for black grades.

Manufacturing consumers of steel are still under pressure for their products, and are therefore absorbing tonnage as fast as it is offered.

It is generally conceded that prices of finished and semi-finished steel will show recessions before the end of the year, but such a development is not yet at hand, say manufacturers, affecting majority of products.

Results of Wage Conference at Atlantic City

Outstanding among the accomplishments of the annual wage conference at Atlantic City between steel manufacturers and employees affiliated with the Amalgamated Association of Iron, Steel and Tin Workers, is a change in the basis of figuring tonnage rates of tin mill workers. Two separate conferences were held, one between the Western Bar Iron Association and workers, and the other between the Western Sheet and Tin Plate Manufacturers' Association, and affected employees.

James H. Nutt of Youngstown, secretary of the manufacturers' associations, summarizes results of the conference as follows—

"No change in the sheet scale and working rules.

"A new basis to figure the wages of tin mill and tin house workers based on the sales price of sheets, instead of tin plate itself. The new arrangement gives tin mill workers an increase of 11 per cent above the base, over what they received under the old agreement.

"The new tin wage is made retroactive to June 1.

"A similar change in the wage basis for tin house workers.

"One dollar advance in the base rate for puddlers."

At present tin workers are paid a rate 26 per cent above base, and sheet mill employees 37 per cent above base. Under the new arrangement sheet and tin workers will always receive the same percentage of increase and decrease.

Youngstown Company Opens New Building

The Youngstown Sheet & Tube Co., Youngstown, has officially opened a new works office building for the Brier Hill department, built at a cost of $400,000 equipped. The building was originally started by the Brier Hill Steel Co., prior to its absorption by the Sheet & Tube company, and was intended to house the principal executive and operating departments of the company.

President James A. Campbell of the Sheet & Tube company gave an informal talk to department heads, stating that the May record of the Brier Hill department had exceeded that of April. He remarked that in the near future improvements will be made to the Brier Hill properties which will tend to more economical operation.

A modern kitchen and dining room where employees are served lunch is one feature of the building. It is located on West Federal Street in Youngstown, opposite the Brier Hill open hearth department.

Shenango Valley Furnaces to Blow Out

YOUNGSTOWN, June 12.—Accumulation of iron together with less active third quarter demand is responsible for some slowing down of blast furnace operations in the Shenango Valley. The Shenango Furnace Co. and the Reliance Coke & Iron Co. are the interests which plan to suspend active stacks at an early date.

In the Mahoning Valley, blast furnace production continues without cessation, the output going chiefly into steel products. In the Youngstown district, iron production is at a peak, with 43 of 46 stacks in blast.

Operation of sheet and tin mills is largely dependent on labor supply and weather conditions. While such units are usually scheduled at a rate near capacity at the beginning of each week, their actual operating rate is about 10 per cent less.

Steel Corporation's Orders Decrease

Unfilled business on the books of the United States Steel Corporation as of May 31 amounted to 6,981,351 tons, or 307,158 tons less than reported for April 30. During April the unfilled business showed a decrease of 114,823 tons, while increases of 119,343 tons, 373,213 tons and 165,073 tons were shown respectively in March, February and January. A year ago the unfilled tonnage was 5,254,228 tons, or 1,727,123 tons less than on May 31, last. Following is the unfilled tonnage as reported by months since January, 1920:

	1923	1922	1921	1920
Jan. 31.....	6,910,776	4,241,678	7,573,164	9,285,441
Feb. 28.....	7,283,989	4,141,069	6,933,867	9,502,081
March 31.....	7,405,332	4,494,148	6,284,765	9,892,075
April 30.....	7,288,509	5,096,913	5,845,224	10,359,747
May 31.....	6,981,351	5,254,228	5,482,487	10,940,465
June 30.....	.....	5,635,531	5,117,868	10,978,817
July 31.....	.....	5,776,161	4,830,324	11,118,468
Aug. 31.....	.....	5,950,105	4,531,926	10,805,038
Sept. 30.....	.....	6,691,607	4,560,670	10,374,804
Oct. 31.....	.....	6,902,287	4,286,829	9,836,852
Nov. 30.....	.....	6,840,242	4,250,542	9,021,481
Dec. 31.....	.....	6,745,703	4,268,414	8,148,122

The largest total of unfilled orders was on April 30, 1917, at 12,183,083 tons. The lowest was on Dec. 31, 1910, at 2,605,747 tons.

The National Cash Register Co., Dayton, Ohio, reports sales of cash registers in May valued at $3,500,000, exceeding by nearly $500,000 the largest previous month's sales in the history of the company. May shipments were also the largest in the company's history.

NEW CONTINUOUS FURNACE

British Design Has Automatically Controlled Intermittent Action of an Ingenious Carriage

The heating furnace here illustrated was introduced in 1921 by Priest Furnaces, Ltd., Middlesbrough, England, and was recently described in the *Iron and Coal Trades Review*, London.

The furnace is 50 ft. long and 10 ft. wide and, when working on steel railroad ties, is credited with a capacity to deliver to the presses at least three plates per min., this output being obtainable on a fuel consumption of 170 lb. per ton of plates heated.

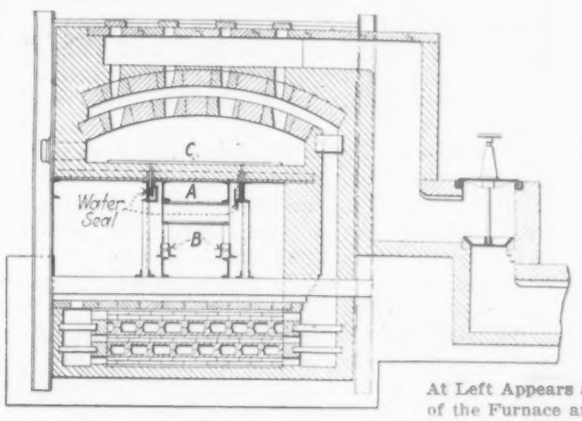
There are three layers of transverse passages of recuperator flues through which the waste gases pass, and two layers of longitudinal passages or flues disposed between the transverse passages. The fuel air, which is supplied under pressure from a fan, passes through the three groups of transverse passages in series and through the flues comprising a group in parallel.

A special feature of the structure is the patented form of brick employed, each brick forming the bottom half of a section of one or more transverse flues and a top half of a section of one or more of the longitudinal flues. It is claimed that recuperative passages so constructed are more efficient than those in which the separate passages are constructed of separate brick as, with the brick under notice, the heat is able to pass more readily from the waste-gas flues to the air-inlet flues. The particular construction of the brick, it is added, effectually prevents leakage of gas or air; it also permits of machine production, which means accuracy of dimensions and of shape—very important considerations.

The carriage structure with which the floor of the furnace is incorporated is the essential feature of the design. The carriage *A* consists of side members tied together with tie-bars and passing under the whole length of the furnace. Ramps *B* are connected to the bottom of each side member, while below each side member are frames carrying rollers which run on rails; the frames also carry rollers, upon which the ramps ride. Water-troughs are mounted on the side members, into which flanges on the underside of the floor dip to form a seal, so that cold air cannot enter the furnace chamber.

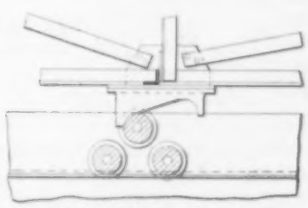
The frames are moved backward and forward by a hydraulic ram. The frames are withdrawn as far as possible by the ram, and the section or plate to be heated is placed across the fixed floor of the carriage; the ram is then operated, moving the frame forward and causing the rollers to run under the ramps so that the carriage—the center of the furnace floor—is lifted. A catch prevents the carriage from moving forward until it reaches its highest position, when the catch becomes disengaged. Thus the center of the furnace floor is raised slightly above the sides, the plates, sheets or slabs, *CC*, being lifted clear, when the rollers engaging the ends of the ramps move the entire carriage forward, so carrying the plate toward the discharge end of the furnace chamber.

When the ram reaches the end of its stroke, it is reversed to withdraw the carriage. As the carriage is withdrawn, it drops by reason of the rollers running under the ramps, being prevented from moving backward by the catch until it has reached its lowest point, when the furnace center is below the sides, so that the slabs or plates come to rest thereon. The catch being released, the rollers engage the ends of the ramps, and allow the carriage to be withdrawn until the ram again reaches the end of its stroke, and the cycle of operations is complete. Thus the steel to be heated is moved a space forward with each succeeding operation.

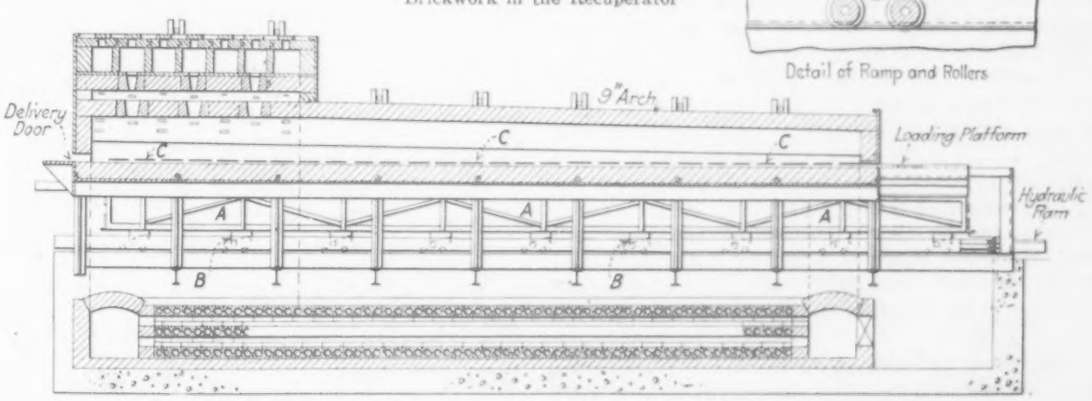


At Left Appears a Cross Section of the Furnace and Gas and Air Passages, Showing the Special Brickwork in the Recuperator

(Below) Carriage Structure *A*, Operating on Ramps and Rollers *B*, Lifts the Plates or Sheets *C* and Advances Them One Space at Each Forward Stroke of the Hydraulic Ram. The carriage then drops to clear the steel being heated and is drawn back (to the right) in preparation for the next forward stroke. Thus steel from the loading table at the right is passed stepwise through the furnace and heated, being finally ejected at the delivery door in condition for rolling or pressing



Detail of Ramp and Rollers



In May the Sharon Steel Hoop Co., Sharon, Pa., shipped 28,000 tons of finished steel products, and its specifications continue firm. It is now enjoying one of the most prosperous peace-time years in its history. The outlook is such that the company expects to have a better last half than first half. For the first five months, earnings are reported at approximately $900,000, after preferred dividends, bond interest and taxes. It is expected earnings for the 12 months will approach $2,000,000 and give the company a net working capital of upwards of $4,000,000.

Iron and Steel Markets

SLIGHT LOSS IN OUTPUT

Mills Shipping More Freely on Contracts

New Buying Still Lags, Awaiting Definite Price Developments

Along with the lessened volume of new orders, the steel trade now finds that the increased rate at which some mills are shipping contract material to their customers is the significant feature of the situation.

On the other hand are cases of reduced production due to loss of labor or to weather conditions. The industry as a whole is making a little less steel, the Steel Corporation's operations being at 3 to 4 per cent under its record rate of early May.

May, as was expected, made a record in steel ingot production at 4,205,000 tons, but with 27 working days, against 26 in April, the estimated daily average was 155,700 tons, against 157,900 tons in April. Thus the April rate may turn out to be the peak for the year.

The moderate reduction of 307,000 tons in the Steel Corporation's unfilled orders last month is another index of the great volume of current steel consumption. Producers have been laying stress on the uniform practice of buyers to avoid accumulating stocks. Recent heavy production and the easier tendency in semi-finished steel as well as in pig iron and scrap indicate a continuance of the policy.

Railroad construction work and equipment are still counted on as the largest factor in steel works operation in the third quarter of the year and later. However, there is a halt in car orders, and with it the frank statement from some of the railroads that present prices of the car builders are too high.

The recent rail-buying movement brought 400,000 to 500,000 tons to mill books, about 200,000 tons going to Chicago and Colorado mills.

The automobile industry reports that some round lots of alloy steel have been bought for third quarter, also that some forge shops and foundries engaged in making parts are slowing down their operations.

Agricultural implement works have begun to buy steel for next fall. One important company has covered for its full needs and another for 60 per cent of expected requirements. The farm machinery industry continues to run at two-thirds capacity.

A Lake shipyard has taken prices on 10,000 tons of plates preliminary to seeking buyers for two freight boats. The Pere Marquette has revived an inquiry for two barges, each of which will take 2600 tons of steel, this being the first Lake vessel business in some months.

New structural awards at 43,500 tons exceed the average of the past four weeks. Included is the 24,700 tons of plates and shapes for the last section of the Hetch-Hetchy water line to San Francisco from the Sierras, informally announced three weeks ago, also 8000 tons of plates for two groups of Texas oil tanks. Of 10,000 tons of new inquiries, the Hudson River vehicular tunnel accounts for 4500 tons. There are indications that further oil tank buying is just ahead.

More plates can now be had for early delivery at the 2.50c. contract price. Thus far the mills' concessions are in terms of time rather than in dollars.

Reports of concessions of $1 to $2 a ton on sheets represent minor tonnages, the future of the general market hinging on the sheet bar price. While $42.50 has been quoted on Bessemer sheet bars, a like price has not been established for open-hearth steel.

Recent price reductions have failed to encourage buyers of pig iron to place sizable orders, and the market continues dull and weak. In some sections, notably in Chicago, prices are untested, owing to the very limited sales. Resales of Southern iron have been made as low as $25, Birmingham, but Alabama furnaces are holding to $27, considering their statistical situation a strong one. Stocks in Alabama yards were reduced 5000 tons last month. As a first indication of lessened pig iron production is the announcement that two Shenango Valley furnaces will blow out on account of unfavorable prospects.

Export inquiry includes 8000 tons for the Imperial Railways of Japan and 6000 tons for a private line there. British prices on sheets have been too low for American mills in a number of cases. In general, little export business can now be had without going below domestic prices.

THE IRON AGE composite price for finished steel remains at 2.789c. per lb., no change having occurred in five weeks. One year ago it was 2.141c.; two years ago, 2.679c.

The week has brought no change in THE IRON AGE pig iron composite price. At $28.46 per gross ton, it compares with $23.89 one year ago and $21.92 two years ago.

Pittsburgh

Few Cancellations—Buyers Still Cautious—Pig Iron Prices Untested

PITTSBURGH, June 12.—The past week has brought some reports of loss of steel production as a result of loss of labor on account of weather conditions, and also that there has been a narrowing of the gap between shipments and new business of as much as 10 per cent in some cases by comparison with the last week in May. New business is better with a number of producers, but the gain is not of such proportions as a general rule to impart real confidence to the trade. Buyers still are disposed to pursue a cautious policy with regard to purchases, seemingly with the intent of determining whether present prices can be maintained. So far, the need of business has not been so great as to lead to any important shading of prices.

The manufacturers are encouraged to take a firm stand by reason of the fact that consumers are still taking all the tonnage due them on old orders and only

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 12, 1923	June 5, 1923	May 15, 1923	June 6, 1922
No. 2X, Philadelphia‡	$30.76	$30.76	$32.76	$26.26
No. 2, Valley furnace†	29.00	29.00	30.00	24.00
No. 2 Southern, Cin'ti†	29.55	29.55	31.05	23.00
No. 2, Birmingham, Ala.†	25.50	25.50	27.00	18.50
No. 2 foundry, Chicago*	32.00	32.00	32.00	23.00
Basic, del'd, eastern Pa.	28.14	28.14	30.25	25.00
Basic, Valley furnace	27.50	27.50	28.00	25.00
Valley Bessemer, del Pitts.	30.77	30.77	31.77	26.96
Malleable, Chicago*	32.00	32.00	32.00	23.00
Malleable, Valley	29.00	29.00	30.00	24.50
Gray forge, Pittsburgh	30.27	30.27	31.27	25.46
L. S. charcoal, Chicago	36.65	36.65	36.65	29.00
Ferromanganese, furnace	130.00	130.00	130.00	67.50
Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$40.00
Bess. billets, Pittsburgh	*42.50*	43.00	45.00	35.00
O.-h. billets, Pittsburgh	*42.50*	45.00	45.00	35.00
O.-h. sheet bars, P'gh.	45.00	45.00	45.00	35.00
Forgings billets, base, P'gh.	*52.50*	55.00	55.00	40.00
O.-h. billets, Phila.	50.17	50.17	50.17	40.74
Wire rods, Pittsburgh	51.00	51.00	51.00	38.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.45	2.45	2.45	1.70
Light rails at mill	2.25	2.25	2.25	1.50
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.72	2.72	2.825	1.96
Iron bars, Chicago	2.60	2.60	2.60	1.70
Steel bars, Pittsburgh	2.40	2.40	2.40	1.70
Steel bars, Chicago	2.60	2.60	2.69	1.75
Steel bars, New York	2.74	2.74	2.74	1.98
Tank plates, Pittsburgh	2.50	2.50	2.50	1.60
Tank plates, Chicago	2.80	2.80	2.84	1.75
Tank plates, New York	2.84	2.84	2.84	1.98
Beams, Pittsburgh	2.50	2.50	2.50	1.60
Beams, Chicago	2.70	2.70	2.84	1.75
Beams, New York	2.84	2.84	2.84	1.98
Steel hoops, Pittsburgh	3.30	3.30	3.30	2.40

Sheets, Nails and Wire,	June 12, 1923	June 5, 1923	May 15, 1923	June 6, 1922
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.85	3.85	3.85	3.15
Sheets, galv., No. 28, P'gh.	5.00	5.00	5.25	4.15
Sheets, blue an'l'd, 9 & 10	3.00	3.00	3.25	2.40
Wire nails, Pittsburgh	3.00	3.00	3.00	2.40
Plain wire, Pittsburgh	2.75	2.75	2.75	2.25
Barbed wire, galv., P'gh.	3.80	3.80	3.80	3.05
Tin plate, 100-lb. box, P'gh.	$5.50	$5.50	$5.50	$4.75
Old Material,				
Carwheels, Chicago	*$22.00*	$22.50	$23.00	$18.25
Carwheels, Philadelphia	23.00	23.00	24.00	17.00
Heavy steel scrap, P'gh.	21.50	21.50	23.00	17.00
Heavy steel scrap, Phila.	18.00	18.00	19.00	15.00
Heavy steel scrap, Ch'go.	*18.00*	18.50	19.00	14.50
No. 1 cast, Pittsburgh	*24.50*	25.00	26.50	18.50
No. 1 cast, Philadelphia	*22.00*	23.00	24.00	19.00
No. 1 cast, Ch'go. (net ton)	22.00	22.00	22.50	16.00
No. 1 RR. wrot. Phila.	23.00	23.00	24.00	17.00
No. 1 RR. wrot. Ch'go. (net)	*15.50*	16.00	17.00	12.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$4.75	$4.75	$5.00	$6.50
Foundry coke, prompt	*5.50*	5.75	6.00	7.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	15.25	15.25	16.25	14.00
Electrolytic copper, refinery	14.75	14.75	15.50	13.75
Zinc, St. Louis	*6.15*	6.40	6.60	5.32½
Zinc, New York	*6.50*	6.75	6.95	5.67½
Lead, St. Louis	*7.00*	7.05	6.90	5.50
Lead, New York	7.25	7.30	7.25	5.80
Tin (Straits), New York	*42.00*	41.87½	41.75	32.50
Antimony (Asiatic), N. Y.	*6.75*	7.00	7.25	5.25

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price June 12, 1923, Finished Steel, 2.789c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets — These products constitute 88 per cent of the United States output of finished steel

June 5, 1923,	2.789c.
May 15, 1923,	2.789c.
June 13, 1922,	2.141c.
10-year pre-war average,	1.689c.

Composite Price June 12, 1923, Pig Iron, $28.46 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

June 5, 1923,	$28.79
May 15, 1923,	29.29
June 13, 1922,	23.89
10-year pre-war average,	15.72

insignificant quantities are involved in such cancellations and suspensions as have been received to date. Buyers, however, are not overlooking the very heavy production of pig iron and ingots over the past several months and the easier tendency in semi-finished steel as well as in pig iron and scrap also is regarded as a warning against the building up of stocks by consumers and distributers.

There is not sufficient demand for pig iron to provide a real test of prices, but it is apparent that the appearance of a real inquiry would result in concessions from today's levels. Lower prices also seem to be ahead for scrap, since there is no mill buying to speak of and the market now is largely without the support it recently had in the shape of purchases against short sales by dealers. Meanwhile railroad offerings of old material now are heavy at a time when not much is wanted.

The materials are available in abundance for the production of steel; indeed, it is probably no exaggeration to say that the steel company reserves of pig iron, scrap and other raw materials now are back to the proportions they were just prior to the depletion resulting from the coal strike of last year. One company in this district estimates the decline in steel production since the first of the month at 10 per cent, but as the general average has been much less than that, output is high for this time of the year. Outside of some of the structural shops which are not getting as much steel as they want, there is no evidence of a lack of supplies among consumers.

Pig Iron.—Prices on all grades are purely nominal since interest on the part of melters is almost completely lacking and producers have assumed an attitude of waiting for consumers to say something rather than seek the level at which business can be done. It is frankly admitted that no considerable amount of tonnage could be sold at today's prices, but development of a trading level is not easy with buyers holding aloof from the market. There have been no important sales of either the steel making or foundry grades in the week under review. A recent inquiry for 100 tons of low phosphorus iron developed considerable competition among the furnaces. The Valley maker of this

grade still is quoting $36, furnace, but on this inquiry a delivered price of about $35.25 was made by Eastern producers.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

Basic	$27.50
Bessemer	29.00
Gray forge	28.50
No. 2 foundry	29.00
No. 3 foundry	28.50
Malleable	29.00
Low phosphorus, copper free	36.00

Ferroalloys.—Absence of important buying is beginning to tell on prices. The market here no longer is quotable above $125, furnace or seaboard, for 80 per cent ferromanganese. Importers of this material here are rather anxious for business, and are known to have offered fair-sized tonnages for July delivery at $125. Such offerings here have found no takers. Domestic producers no longer are asking more than $125 for early delivery and it is believed would shade that price to get some fourth quarter business. The market also is weaker on 50 per cent ferrosilicon, which, although nominally quoted as high as $92.50 delivered, is being offered by at least one producer at $90, and it is believed even less than the latter price would be named on an attractive inquiry. Consumers are too well covered to be interested in further supplies. Business in spiegeleisen in this district is very limited, and while quotations are unchanged, they are fairly nominal in the absence of important sales or inquiries. In this material, also, consumers are well covered against their requirements for the next two months. Prices are given on page 1745.

Semi-Finished Steel.—Hardly enough business is being done to clearly define just what prices are. Those manufacturers who do not produce their own steel, as for several weeks past, are getting full allotments from their regular supply sources, and because of hindrances to full finishing mill operations, as a result of labor shortages incident to warm weather, some are beginning to accumulate reserve supplies. This condition naturally reduces both the number and volume of open market inquiries, and there having been no material let-down in the production of ingots, producers are beginning to show more anxiety for business. This tendency at the moment shows stronger in billets and slabs than in sheet bars. The latter still are held generally at $45, Pittsburgh or Youngstown, but an appraisal of the market on billets and slabs based upon a few recent tests indicates a range of $42.50 to $43 on these forms. There are occasional sales of forging billets at $55, but there also has been business as low as $52.50. On wire rods $51 base is the top and bottom of the market. Interest in pipe skelp is very limited, and the quoted price is entirely nominal. Prices are given on page 1745.

Wire Products.—Manufacturers in this district claim a considerable loss of production since the first of the month on account of labor defections due to hot weather. Demand for nails and black wire continues heavy, but there is no sign yet of a revival of interest in barbed wire for woven fence. Leading producers are diverting much steel which has been going to the latter products into plain wire and nails in an effort to reduce their obligations in these lines. Prices are given on page 1744.

Structural Material.—We note no tendency on part of mills in this district to shade the regular price notwithstanding that new demands are small in keeping with current orders to local fabricating shops. Prices are given on page 1744.

Plates.—Buyers no longer have any difficulty in finding a place on mill order books at 2.50c. base, Pittsburgh, but we note no tendency on the part of the mills to go lower for orders. Prices are given on page 1744.

Steel Rails.—Low rate of coal mine operations accounts for a very limited demand for light rails, but makers do not yet need business badly enough to shade prices.

We quote 25 to 45-lb. sections, rolled from new steel, 2.25c. base; rolled from old rails, 2.15c. to 2.20c. base; standard rails, $43 per gross ton mill for Bessemer and open-hearth sections.

Tubular Goods.—Pressure for shipments of steel pipe against old orders still is very insistent both in merchant pipe and oil country goods, and some makers note a slightly increased amount of new demand as compared with recent weeks. There are some cancellations of oil country pipe orders, but the amount of tonnage is said to be insignificant and some mills still claim to be losing business because of their inability to make deliveries promptly enough. Specifications against boiler tube orders are heavy and urgent, but new business still is moderate. Makers have about eight to 10 weeks' business in sight. Discounts given on page 1744.

Sheets.—Reports of easier market conditions, particularly with regard to black and blue annealed sheets from other centers, find no verification here. The leading interest already is sold up fully for the third quarter, and cannot make a positive promise of delivery against additional tonnages before Oct. 1. Independent makers have at least two months' business on their books and in view of the plant suspensions planned for the early part of July for repairs and vacations, are not likely to have much open capacity for tonnage to be delivered in the third quarter. The spot demand having disappeared, the market is quotable at the Steel Corporation bases of 3.85c. for black, 3c. for blue annealed and 5c. for galvanized. Prices are given on page 1744.

Tin Plate.—Business is restricted for want of something to sell. Practically all mills are obligated for third quarter, and are not disposed to enter business beyond the end of that period. All indications now point to a heavy pack of perishable foods and fears are expressed that with the summer at hand, it will be impossible to get out all the tin plate that will be needed for containers. The price of all mills to their regular customers is $5.50 per base box, Pittsburgh. Production for the first half of this year is expected to establish a new high record, but despite that fact, few mills have very large stocks of what are known as "stock items."

Hot-Rolled Flats.—All products under this heading still are priced at 3.30c. base, Pittsburgh, for the ordinary gages and widths. On light narrow stock, an effort is being made to secure 3.50c. base when such constitutes the bulk of orders, but when a part of the order involves other sizes, the whole takes the 3.30c. price. On hot-rolled strips for cold rolling, the usual discount of $3 per ton from the base price prevails. Prices are given on page 1744.

Cold-Rolled Strips.—The market is quotable at 5.25c. base on both prompt and third quarter business. Some mills are well sold up for the latter period, while others still are open to business.

Bolts, Nuts and Rivets.—Last week's statement that makers of bolts and nuts would probably continue the second quarter prices into the third quarter requires amplification. It now develops that practically no business was done at the discounts published around March 1, and that these quotations were named chiefly for the purpose of stimulating specifications at the former quotations. The market at that time was on a basis of 50 and 10 per cent off list for large machine bolts, and the prices for third quarter will probably be at that base instead of 40 and 10 per cent off list, the published quotation. A similar situation exists in rivets, which were priced as high as $3.50, base, per 100 lb. for heavy structural and ship rivets, but which, in only a few instances, and then for small lots, sold above $3.25. Third quarter business in the latter will probably be at $3.25, base. Current business is moderate, but buyers are specifying fairly well on old orders. Prices and discounts given on page 1744.

Cold-Finished Steel Bars and Shafting.—New business, as distinct from specifications on old orders, shows some increase with several makers in this district. The gain is not large, but is encouraging in view of the fact that buying was pretty slow during the previous few weeks. Suspension of shipments by buyers are declared to involve only an insignificant tonnage.

On strictly new business, the regular quotation of 3.25c. base, Pittsburgh, for carload is well observed. Some makers still owe buyers considerable material carrying prices much below today's level. Ground shafting is unchanged at 3.65c. base, f.o.b. mill, for carload lots.

Iron and Steel Bars.—All makers in this district are holding firmly to 2.40c. base, Pittsburgh, for steel bars, as the need of business is not yet great enough to induce price concessions. Current demands are small. Prices of iron bars also are being maintained.

We quote soft steel bars, rolled from billets, at 2.40c., base; bars for cold-finishing of screw stock analysis, $3 per ton over base; reinforcing bars, rolled from billets, 2.40c., base; refined iron bars, 3.25c. base, in carload lots or more f.o.b. Pittsburgh.

Track Fastenings.—Makers here are well supplied with business in large railroad spikes, bolt and barge spikes, and in tie-plates, but their order books are pretty well depleted on small railroad spikes, this being due to the low rate of operation in the coal mines. Large track bolts no longer are quotable above $4.25, base, per 100 lb., and it is believed that attractive inquiries will induce some cutting of that price. Prices are given on page 1744.

Old Material.—The market here is extremely dull, and inclined toward weakness. Dealers short of the market appear to have covered their contracts pretty well, and the melters in this territory are showing no interest in additional supplies. Prices lack the support they recently had in purchases by dealers anxious to complete contracts to avoid cancellations, and are depressed by the fact that some cancelled tonnages are being forced on the market. Railroads are offering heavy tonnages of old material, and the Norfolk & Western Railway, in a supplementary list just issued, is asking bids on more than 1000 gross tons of short rails. It is not possible to make any change in heavy melting steel, but practically all other grades are off from last week's prices.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton

Heavy melting steel	$21.50 to $22.00
No. 1 cast, cupola size	24.50 to 25.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	22.00 to 22.50
Compressed sheet steel	20.50 to 21.00
Bundled sheet sides and ends	19.00 to 19.50
Railroad knuckles and couplers	24.50 to 25.00
Railroad coil and leaf springs	24.50 to 25.00
Low phosphorus standard bloom and billet ends	26.50 to 27.00
Low phosphorus, plates and other grades	25.00 to 25.50
Railroad malleable	24.00 to 24.50
Steel car axles	25.00 to 25.50
Cast iron wheels	23.00 to 23.50
Rolled steel wheels	24.50 to 25.00
Machine shop turnings	17.75 to 18.25
Heavy steel axle turnings	18.75 to 19.25
Short shoveling turnings	17.75 to 18.25
Cast iron borings	18.00 to 18.50
Heavy breakable cast	20.00 to 20.50
Stove plate	17.50 to 18.00
Sheet bar crop ends	25.50 to 26.00
No. 1 railroad wrought	18.00 to 18.50

Coke and Coal.—One contract for third quarter furnace coke amounting to about 12,000 tons a month has been closed since a week ago at $5.75 per net ton at ovens, but the general contract level still is $5.50, the higher price in this case being due to the fact that the particular brand sold is better suited to the requirements of the buyer than other brands. Some oven operators are sold up for practically all the coke they will produce during the third quarter, but there are a great many not in this condition and present indications are that the remaining supplies will sell at less than $5.50 rather than above that figure. The contract foundry coke market is weaker, as the efforts to line up foundries at $7 or higher for last half have not been successful. Producers now are quoting from $6.25 to $6.75, but not much contract business has been closed. The spot furnace coke market still is quotable from $4.75 to $5.25 per net ton at ovens, but as a general proposition the market is $5 for good standard coke. Spot foundry coke ranges from $5.50 to $6. The coal market still is rather soft and we note a slightly lower limit on mine run gas and coking coal, sales of which have lately been made at $2.35 per net ton at mine against $2.50, the recent minimum. Mine run steam coal still is quotable at from $1.75 to $2.25, while $2.50 now seems to be the top on mine run gas and coking coal.

Hearing in Suit to Prevent Absorption of Steel & Tube Co. of America

In the suit brought by the Allied Chemical & Dye Co. to restrain the proposed absorption of the Steel & Tube Co. of America by the Youngstown Sheet & Tube Co., hearings were begun in Wilmington, Del., Monday, before Chancellor Wolcott. A temporary injunction was granted in April against the disposition of the plant for $73,000,000, it being contended by the complainant that the valuation is at least $25,000,000 below what the stockholders should receive.

Charles F. Faucett of Milwaukee, counsel for the defendant, argued that the amount specified is a fair valuation.

It is expected that a decision will be rendered at an early date.

Industrial Activity at Springfield, Ohio

SPRINGFIELD, OHIO, June 11.—To meet the demands of the trade the Steel Products Engineering Co. has added a night force. As a result of orders received from the Government and also from various concerns the indication are that the plant will be operated with a day and a night force all summer.

The Superior Gas Engine Co. and James Leffel & Co. are being operated with full forces. Both have a number of good orders ahead. The new machine shop of the Superior Gas Engine Co. has been roofed and will soon be ready for occupancy. It is stated that the company is planning for further expansion within the next year.

Both plants of The Armstrong Mfg. Co. are operating full time. Enough orders have been booked for the No. 1 foundry to keep it busy the most of the year. The No. 2 plant, where heavy castings are made, has sufficient business ahead to last it for several months.

The Enamelight Corporation, Detroit, has been organized with a capitalization of $100,000 to manufacture and sell a commercial lighting unit. The new organization has taken over the Enamelight company, which has been developing and marketing its product for the last year, and has taken temporary offices at 546 Book Building, Detroit. The company has manufacturing plants in Steubenville, Ohio, Coraopolis, Pa., Chicago and Detroit, and is equipped to produce 25,000 units per week. Officers of the company are: R. D. Wardell, president; Frank Farrington, vice-president; F. W. Kanter, secretary; H. J. Guthard, treasurer. The directors comprise the above officers and G. E. Miller.

Official announcement was made Saturday, June 9, that Walter P. Chrysler has increased his holdings with the Maxwell Motor Corporation to the extent that hereafter he will be permanently associated with that organization. Mr. Chrysler was retained about three years ago as chairman of the board of directors to undertake the development and upbuilding of the Maxwell-Chalmers properties, but he did not relinquish his other activities at that time. Mr. Chrysler was at one time president and general manager of the Buick Motor Co., and later a vice-president of the General Motors Corporation.

The Republic Steel Package Co., Richmond, Cal., recently organized, will take over a plant which has been in operation for about 15 months, previously operated by the Republic Steel Package Co., Cleveland.

Chicago

Few Orders for Pig Iron or Finished Materials —Consumption Heavy

CHICAGO, June 12.—The situation in most departments of the market closely approximates a buyers' strike. New business is light and it is evident that consumers are holding back their purchases in the hope that prices will take a downward turn. The dearth of buying is most pronounced in pig iron, but in finished steel also new commitments are small and heavy shipments are steadily reducing the mills' obligations. Reports of concessions in steel are more numerous, but nothing resembling a general decline has taken place and in view of the comfortable bookings of most mills, prices of most rolled products, with the possible exception of tin plate and sheets, are expected to hold for some time.

Local prices on plates, shapes and bars are still notably firm, as evidenced by the fact that material for specific delivery is commanding $2 to $4 a ton more than for indefinite shipment. Buyers, however, are impressed by the heavy production of the mills and look forward to the time when supply will exceed demand and the advantage in the market will revert to them. Mills, on the other hand, are encouraged by the absence of cancellations and suspensions and the evidences of sustained consumption to be observed on all sides. They are confident that buying will be resumed on a broad scale before prices are seriously disturbed, but time alone will determine whether their view or that of the buyers is correct. It is therefore not unreasonable to expect that watchful waiting will continue to be the policy of the trade until either seller or buyer is forced to break the deadlock.

Notwithstanding what appears to be the general characteristic of the market, fabricating awards for the week reached the record-breaking total of 34,700 tons. Of this amount, however, the Hetch Hetchy aqueduct, California, alone accounted for 24,700 tons. On the other hand, 8000 tons was involved in two oil storage tank lettings, the first tank awards in several weeks. Further tank buying is expected in view of a number of attractive inquiries which have appeared. While a revival of activity in that field may develop because of conditions peculiar to the oil industry, railroad car purchases have almost entirely ceased and the carriers are frank to state that they regard the car-builders' present prices as too high.

Ferroalloys.—A carload of resale ferromanganese was sold for prompt shipment at $120, seaboard, but the general quotation for all deliveries is now $125. A local melter has purchased a car of 14 to 16 per cent ferrosilicon. Otherwise the alloy market has been without features.

We quote 80 per cent ferromanganese, $130.56 for all deliveries; 50 per cent ferrosilicon, $95, delivered; spiegeleisen, 18 to 22 per cent, $53.58 to $56.08, delivered.

Pig Iron.—In the absence of buying the market is untested and the quotation of $32, base, local furnace, is largely nominal except on sales of spot cars. While this price has been shaded in territory intermediate between Chicago and other producing centers, no concessions have been reported in this city or in the section of the West regularly served by local furnaces. As low as $30, base, Chicago, is reported to have been quoted in central Michigan, but the business was lost to a Lake Erie furnace. In the face of the firmness of Chicago furnaces in this district, buyers believe that prices will be forced down as the result of declines in other producing centers. Prices at Lake Erie, Ironton and Valley furnaces will not have to recede much further before they can deliver at Chicago at less than the present local quotation. Small amounts of resale iron have been sold at concessions, Southern resale having changed hands at as low as $25. Most Southern producers continue to hold to $27, base, Birmingham, and the lowest furnace quotation reported here is $26. A local melter is inquiring for 2500 tons of malleable and foundry, but otherwise there are no sizable tonnages before the trade. A Milwaukee melter has purchased 100 tons of low phosphorus for prompt shipment at a price which was not disclosed. A Wisconsin foundry closed for 100 tons of 9 per cent silvery at a reported concession of $2 under the market.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards or, when so indicated, f.o.b. furnace other than local:

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$36.65
Northern coke, No. 1, sil. 2.25 to 2.75	33.00
Northern coke, foundry No. 2, sil. 1.75 to 2.25	32.00
Malleable, not over 2.25 sil	32.00
Basic	32.00
High phosphorus	32.00
Southern No. 2	$32.01 to 33.01
Low phos., sil. 1 to 2 per cent, copper free (nominal)	$37.00 to 38.00
Silvery, sil. 8 per cent	44.29

Plates.—With the almost complete disappearance of railroad car buying, demand for plates is developing from other sources. A bay crossing line for the Hetch-Hetchy Aqueduct, Cal., requiring 16,700 tons of plates, has been awarded to the M. W. Kellogg Co., New York. Steel penstocks for the Moccasin Creek power plant of the same project, requiring 8000 tons, were let to the Western Pipe & Steel Co., Oakland, Cal. The Humble Oil Co. has placed 10 80,000 bbl. oil storage tanks, involving 3000 tons, for erection in Texas, to the Chicago Bridge & Iron Works. The Magnolia Petroleum Co., Galveston, Tex., has let 20 55,000 bbl. tanks, requiring 5000 tons, to the United Iron Works. Other oil interests are expected to enter the market soon. A local builder is inquiring for steel for 150 tank cars to be built for an unnamed Western oil company. The Federal Government is in the market for 16 river barges, involving 1800 tons, and the Pere Marquette is inquiring for two Great Lakes car ferries. The American Shipbuilding Co. contemplates the construction of two lake freighters for resale. Notwithstanding these large individual projects, general demand for plates is not brisk and with shipments greatly exceeding new business, mills are steadily reducing their obligations. The price situation is firm and unchanged.

The mill quotation is 2.60c. to 2.80c., Chicago. Jobbers quote 3.30c. for plates out of stock.

Structural Material.—Fabricating lettings and inquiries are more numerous, although they involve smaller tonnages on the average than was the case earlier in the year. Railroad work continues to figure prominently in the market and with their needs great and their earnings large, the carriers are expected to continue their construction programs through the remainder of the year. Plain material prices are firm and mills are shipping heavily against old business.

The mill quotation on plain material is 2.60c. to 2.70c. Chicago. Jobbers quote 3.30c. for plain material out of warehouse.

Bars.—Automobile production is being maintained at a record-breaking rate, but some manufacturers are manifesting apprehension as to the future by exercising a more conservative policy in purchasing supplies. Agricultural implement manufacturers look forward to their fall business with confidence and are commencing to buy their steel requirements. One important company has covered its full needs, a second has bought 60 per cent of its anticipated requirements, and others are taking similar action. The farm machinery industry continues to operate at two-thirds of capacity. Most consumers of soft steel bars, however, are pursuing an exceedingly cautious policy and are holding their purchases to the minimum in the hope that prices will take a downward turn. Although local mills are slowly reducing their backlogs, their prices are unchanged and firm. Demand for bar iron is largely from the railroads and is lighter than usual. Although a few concessions are reported, the market is still generally quotable at 2.60c. Chicago. Hard steel bar mills are receiving more liberal orders and specifications from the

implement industry, which is now preparing for its fall trade. Demand for reinforcing steel has fallen off.

Mill prices are: Mild steel bars, 2.50c. to 2.60c., Chicago; common bar iron, 2.60c., Chicago; rail steel, 2.25c. to 2.30c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 4.30c. for rounds and 4.80c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 3.15c. base; hoops, 4.55c.; bands, 3.95c.

Wire Products.—Demand for nails is maintained, but other wire products are easier. In view of the absence of cancellations and suspensions, the present pause in buying is regarded as a temporary lull. It is conceded that jobbers are fairly well stocked, but it is pointed out that dealers have low inventories and that when they are depleted the jobbers' stocks will soon be wiped out. Mills are well booked ahead and prices are firm. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1744.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, $3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, $3.95 per 100 lb.; cement coated nails, $3.40 per keg.

Cast Iron Pipe.—The American Cast Iron Pipe Co. will furnish 500 tons for Sidney, Ohio. Charles M. Porter, Chicago, has the general contract for water mains at Highland Park, Ill., but has not yet placed the pipe, involving 280 tons. Cayuga, Ind., took bids yesterday on 160 tons of 4-, 6- and 8-in. Warren, Ohio, takes bids June 14 on 165 tons of 6-in., Class B, 115 tons of 8-in. and 68 tons of 10-in.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $64.20; 6-in. to 12-in., $60.20; above 12-in., $58.20 to $59.20; class A and gas pipe, $5 extra.

Bolts and Nuts.—Third quarter contracting is getting under way, but the market is still notably quiet and buyers are parrying for concessions. Sellers, however, find encouragement in sustained operations among their customers.

Jobbers quote structural rivets, 4c.; boiler rivets, 4.10c.; machine bolts up to ⅞ x 4 in., 45 and 5 per cent off; larger sizes, 45 and 5 off; carriage bolts up to ¾ x 6 in., 40 and 5 off; larger sizes, 40 and 5 off; hot pressed nuts, squares and hexagons, tapped, $2.50 off; blank nuts, $2.50 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off.

Sheets.—Demand continues to lag and reports of concessions of from $1 to $2 a ton are more frequent. These instances, however, are still in the minority and a large part of the business which is being closed is bringing the full market. Mills are expected to show strong resistance to a general reduction in the market unless they succeed in obtaining their third quarter sheet bars at lower prices. Conversion costs, they assert, would not warrant a decline in sheets unless sheet bars should recede at least to $40.

Mill quotations are 3.85c. for No. 28 black, 3c. for No. 10 blue annealed and 5c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote, f.o.b. Chicago, 4.35c. for blue annealed, 5.20c. for black and 6.35c. for galvanized.

Reinforcing Bars.—There are fewer lettings of 100 tons or more, but small orders are still plentiful. A large amount of pending business is unclosed, but it is to be noted that new projects are not so numerous. Improved deliveries from the mills have put dealers in a more comfortable position so far as stocks are concerned.

Lettings include:

Lloyd Mfg. Co. plant, Menominee, Mich., 250 tons to Truscon Steel Co.

Smith, Bridgeman & Co. store, Flint, Mich., 225 tons to Truscon Steel Co.

Wisconsin road work, 125 tons to Kalman Steel Co.

University of Minnesota, Minneapolis, engineering building, 100 tons to C. A. P. Turner.

Sanitarium, Glenn Lake, Minn., 100 tons to Cowin & Co.

Eight-story apartment hotel for A. V. Lee, Detroit, Mich., 165 tons to McRae Steel Co.

Pending business includes:

Commonwealth Edison Co. Chicago machine shop, Fisk Street and Chicago River, 200 tons, bids on general contract taken June 8.

Addition to Underwriters Laboratories, Chicago, 175 tons, bids on general contract closed June 11.

Eddy Paper Corporation warehouse, White Pigeon, Mich., 125 tons.

Headhouse and concourse, Chicago Union Station, 500 tons, general contract to be closed June 14.

Underground Construction Co., work for Illinois Central Railroad, 175 tons.

Ford Motor Co., plants at St. Paul, Minn., and Iron Mountain, Mich., tonnage not estimated.

Fairmont Creamery Co., power house and creamery, Fargo, N. D., 200 tons.

Warehouse Prices.—Local jobbers have reduced cold-rolled steel bars and shafting to $4.30 per 100 lb. for rounds and to $4.80 for flats, squares and hexagons.

Rail and Track Supplies.—The formal distribution of the New York Central rails gave the Illinois Steel Co. 57,100 tons, the Inland Steel Co., 12,050 tons, the Carnegie Steel Co. 13,350 tons, and the Bethlehem Steel Co. 67,500 tons. These rails are desired for shipment this year. Rail orders from Western roads placed within the past three weeks aggregate more than 60,000 tons. Fully 500,000 tons of rails were placed by American roads during the recent buying movement, and out of that total about 200,000 tons were divided between Chicago and Colorado mills. Although this is not the season for purchases of track supplies, upwards of 20,000 tons of tie plates are under consideration and there is a fair demand for spikes and bolts. Current inquiries for spikes and bolts from the Louisville & Nashville and the Chesapeake & Ohio involve 15,000 to 20,000 kegs. Demand for light rails is slack owing to the curtailed operations of coal mines.

Standard Bessemer and open-hearth rails, $43; light rails, rolled steel, 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 3.25c. mill; track bolts with square nuts, 4.25c. mill; iron tie plates, 2.85c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.80c. base and track bolts, 4.80c. base.

Old Material.—The market is exceedingly quiet and prices continue to recede. There is still a small amount of buying by short interests which have orders to fill by July 1, and consumers are commencing to purchase in a quiet way as the gap between scrap and pig iron prices widens. This is particularly true of malleable and cast grades. Steel works are out of the market and one large interest has stopped shipments against old orders. Railroad lists include the Wabash, 5400 tons, the Nickel Plate and its subsidiary, the Lake Erie & Western, 1900 tons; the Louisville & Nashville, 10,000 tons; the Chicago Great Western, 700 tons, and the Chesapeake & Ohio, 4200 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$22.50 to $23.00
Cast iron car wheels	22.00 to 22.50
Relaying rails, 56 and 60 lb.	28.50 to 29.50
Relaying rails, 65 lb. and heavier	32.00 to 35.00
Rolled or forged steel car wheels	22.50 to 23.00
Rails for rolling	19.50 to 20.00
Steel rails, less than 3 ft.	21.00 to 21.50
Heavy melting steel	18.00 to 18.50
Frogs, switches and guards cut apart	18.00 to 18.50
Shoveling steel	17.75 to 18.25
Drop forge flashings	14.50 to 15.00
Hydraulic compressed sheets	16.50 to 17.00
Axle turnings	16.50 to 17.00
Per Net Ton	
Iron angle and splice bars	23.00 to 23.50
Steel angle bars	17.50 to 18.00
Iron arch bars and transoms	22.50 to 23.00
Iron car axles	27.50 to 28.00
Steel car axles	20.50 to 21.00
No. 1 busheling	15.00 to 15.50
No. 2 busheling	11.50 to 12.00
Cut forge	16.00 to 16.50
Pipes and flues	12.00 to 12.50
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	16.00 to 16.50
Steel knuckles and couplers	20.00 to 20.50
Coil springs	21.50 to 22.00
No. 1 machinery cast	22.00 to 22.50
No. 1 railroad cast	20.00 to 20.50
No. 1 agricultural cast	20.00 to 20.50
Low phos. punchings	17.50 to 18.00
Locomotive tires, smooth	18.50 to 19.00
Machine shop turnings	11.50 to 12.00
Cast borings	13.00 to 13.50
Short shoveling turnings	13.00 to 13.50
Stove plate	15.00 to 15.50
Grate bars	15.00 to 15.50
Brake shoes	15.00 to 15.50
Railroad malleable	22.00 to 22.50
Agricultural malleable	21.50 to 22.00

New York

Reduction of Pig Iron Prices Fails to Develop Much Business

NEW YORK, June 12.—The $2 per ton reduction made by eastern Pennsylvania furnaces resulted in very little business coming out and buyers are still looking for lower prices. Interest centers in the purchase of 500 tons of No. 2X by a prominent machinery company. The price paid has been carefully guarded by the purchaser, but it is known that several furnaces which bid $30 per ton, furnace, for No. 2X lost the business and it is understood that other bidders showed a disposition to disregard the usual differentials. The company will be in the market within a few days for an additional tonnage. Malleable buyers are sounding the market, but there seems to be no indication that any considerable tonnage will be placed by them immediately. Reports from New England indicate foundries are extremely busy on old orders, but that new orders are not coming in as might be desired. Deliveries in New England by the New Haven Railroad have shown remarkable improvement, in fact, some foundries are unable to obtain enough laborers to unload cars as rapidly as they are received, and are compelled to ask for deferring of deliveries.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$33.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	32.27
East. Pa. No. 2 fdy, sil. 1.75 to 2.25	31.27
Buffalo, sil. 1.75 to 2.25	$33.41 to 33.91
No. 2X Virginia, sil. 2.25 to 2.75	34.44
No. 2 Virginia, sil. 1.75 to 2.25	33.44

Ferroalloys.—The principal inquiry for ferromanganese before the market is one for 500 tons for delivery in the last half, which has probably gone to a British producer at $125, seaboard. Otherwise demand is confined to carload and small lots asked for by consumers as they need the alloy, which is of course for fairly early shipment. For prompt delivery $130, seaboard or furnace, is the quotation. The spiegeleisen market is very quiet, with prices unchanged at $45 to $47.50, furnace, for the 20 per cent alloy and $44 to $46.50, furnace, for the lower grade. There have been sales of carload and small lots for early shipment and some contracting for the last half. The 50 per cent ferrosilicon market is quiet and steady at unchanged prices.

Cast-Iron Pipe.—Makers still report an active demand, more rapid fulfillment of which is prevented by labor shortage. Deliveries being offered still extend well up to Oct. 1, and prices are firm. We quote per net ton, in carload lots, f.o.b. New York, as follows: 6-in. and larger, $58.50; 4-in. and 5-in., $63; 3-in., $68.80, with $4 additional for Class A and gas pipe. Makers of soil pipe report jobbers' stocks well filled and very little buying. Discounts continue unchanged in general, although some shading has occurred, in one instance a Southern seller having transacted some business at about 5 points better than the Northern market, but even these concessions, it is said, have brought out only a few carloads. We quote discounts of both Northern and Southern makers, f.o.b. New York, in carload lots, as follows: 6-in. standard, 13 to 15¾ per cent off list; heavy 23 to 25¾ per cent off list.

Finished Iron and Steel.—More spirited competition for fabricated steel work and consequent lowering of quotations amounting to about $10 a ton have brought more awards in the metropolitan district than have developed in several weeks. The aggregate tonnage of pending inquiries is also larger than for some weeks. In concrete construction work there is also more competition with slight concessions, it is reported, in prices quoted on concrete bars. Mills rolling bars from new steel state that they have not gone below 2.40c., Pittsburgh, for bars, but it is common belief that orders have been placed at 2.35c. and even at 2.30c., possibly to so-called rerolling mills. In general it may be said that prices on all forms of steel are holding firmly so far as the larger producers are concerned. Reports from the Central West of shading on tin plate find no duplication here, it being stated that tnere is no difficulty in selling at $5.50 per base box. Some mills which held out for $6 find difficulty, however, in getting that figure. Final figures on the rail award of the New York Central give 67,500 tons to the Bethlehem Steel Co., 57,100 tons to the Illinois Steel Co., 13,350 to Carnegie Steel Co. and 12,050 tons to Inland Steel Co.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.74c. to 2.84c.; plates and structural shapes, 2.84c.; bar iron, 2.74c.

Warehouse Business.—With the exception of black and galvanized sheets, the market is substantially unchanged from last week. Business is slightly quieter, but the demand for plates out of stock is still heavy. Black sheets are particularly dull, while the galvanized sheet market is only fairly active and shading in both grades is reported prevalent. With 5.25c. per lb. and 6.25c. per lb. base, the official schedule of most warehouses in New York on black and galvanized respectively, on desirable lots, prices have been shaded down to 4.75c. and 5.75c. per lb. base for black and galvanized. The pipe market continues fairly active and warehouses handling wrought iron and steel pipe report a continued shortage of the smaller sizes, mill deliveries being slow. No change is noted in brass and copper products. We quote prices on page 1762.

Coke.—Spot foundry coke is now quoted at $5.75 to $6.25 per ton, and furnace coke for spot shipment is from $5.25 to $6 per ton. On contracts foundry coke is available at recent quotations, while furnace coke contracts are usually made at $6 per ton or slightly lower. The price of by-product coke is $12.34 to $12.41, Newark and Jersey City points.

Old Material.—The market is again slightly weaker, a fair range of prices on heavy melting steel New York being $14.50 to $15 per ton, with railroad quality at $15 to $15.50 per ton. Delivered eastern Pennsylvania $18.50 and in some instances $19 per ton are paid with $18 delivered being paid for railroad quality. Some cancellation of higher priced contracts by mills is reported where deliveries had not been completed by the date specified. Some stove plate is reported moving to consumers in Phoenixville and Harrisburg and $15 per ton is being paid for specification pipe delivered Milton. On machine shop turnings, $15.75 per ton is being paid by some dealers delivered Phoenixville. Stove plate is quotable in the New York district at $12.75 to $13.25 per ton, based upon $16.25 per ton, delivered eastern Pennsylvania. But little buying of stove plate by New Jersey foundries is reported.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$14.50 to $15.00
Steel rails, short lengths, or equivalent	15.00 to 15.50
Rails for rolling	16.00 to 18.00
Relaying rails, nominal	25.00 to 26.00
Steel car axles	20.00 to 21.00
Iron car axles	25.00 to 26.00
No. 1 railroad wrought	17.00 to 18.00
Wrought iron track	16.00 to 16.50
Forge fire	12.75 to 13.25
No. 1 yard wrought, long	15.50 to 16.00
Cast borings (clean)	12.75 to 13.25
Machine-shop turnings	12.75 to 13.25
Mixed borings and turnings	12.75 to 13.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.00 to 11.50
Stove plate	12.75 to 13.25
Locomotive grate bars	13.00 to 13.50
Malleable cast (railroad)	20.00 to 21.00
Cast-iron car wheels	18.00 to 19.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$21.00 to $22.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	20.00 to 21.00
No. 1 heavy cast, not cupola size	18.00 to 19.00
No. 2 cast (radiators, cast boilers, etc.)	16.00 to 17.00

Contracts for Oil Tanks

YOUNGSTOWN, June 12.—The Youngstown Boiler & Tank Co. has been awarded a contract for twenty 55,000-bbl. oil tanks for the Texas fields, involving the use of 3000 tons of plates which have been ordered. The order represents an investment of upward of $400,000.

Cincinnati

Lower Prices Named in Southern Ohio—Tennessee Iron Selling at $25.50, Birmingham

CINCINNATI, June 12.—The southern Ohio furnace which has been actively soliciting business booked approximately 3500 tons during the week, 1000 tons of which went to a central Ohio melter at $28, Ironton basis, and 2000 tons to a southern Ohio melter at $28.50. Small lots made up the rest of the tonnage. Another furnace is reported to have booked several hundred tons from an Indiana melter at $28, Ironton basis. These sales constituted the greater part of the market activity. On at least one of the above lots, several quotations of $28, Ironton, were made, and while some furnaces are still asking $29, the lower figure represents today's market. It is reported that silvery prices have been shaded $1 a ton on carload orders, more particularly in the Detroit district. Basic and Bessemer are not in demand. Tennessee iron is still available at $25.50, Birmingham, for prompt shipment, but Alabama furnaces are holding to $27, base, and are quoting this price for third quarter. Indications are that furnaces which had been reported to be sold through third quarter will have tonnages to offer for this delivery, as production is heavier than anticipated, due principally to good furnace operations. Apparently there has been no let-up in the melt in the South, or the Cincinnati district, but reports from automobile parts manufacturers indicate a tendency to curtail operations. So far, no holdups of pig iron shipments have been requested and melters are taxing all the iron due on contracts and in some cases anticipating shipments. There is no inquiry current, although one large melter, with plants in various parts of the country, is understood to be figuring on 20,000 tons of malleable and basic for third quarter.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$29.55 to $31.05
Southern coke, sil. 2.25 to 2.75 No. 2 soft)	30.05 to 31.55
Ohio silvery, 8 per cent	40.77 to 41.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	30.27 to 30.77
Basic Northern	29.77
Malleable	30.27 to 30.77

Finished Materials.—Orders are becoming more numerous for finished materials, but sizable tonnages are still lacking. There has been no let-up in manufacturing, apparently, for consumers are still keeping right after the mills for shipment on contracts. No holdups of tonnages have been reported so far, even from manufacturers closely allied with the automotive industry. Agricultural implement manufacturers have not as yet shown much interest in fall requirements of steel, but are buying specialties from time to time. Inquiries for sheets for immediate shipment are fair, though consumers are showing more interest in receiving shipments on their contracts. Third quarter requirements have been pretty well covered. Demand for wire and wire products continues fair. Prices generally remain at last week's levels. Some of the independent mills, which had been asking 2.50c. for bars and 2.60c. for shapes and plates, have now come down to the market level of 2.40c. and 2.50c. respectively. Reports are heard of shading of sheet prices, but in these cases exceptional circumstances attend the offers. Deliveries are showing much improvement. The structural market is more active. The Champion Coated Paper Co., Hamilton, Ohio, is taking bids on an addition requiring 600 tons. A Scottish Rite Temple at Nashville, Tenn., will be let June 14. This project involves about 700 tons. The L. & N. Railroad has taken bids on 150 tons, and the Big Four Railroad has awarded 1200 tons of plate girders to the McClintic-Marshall Co. Reinforcing bars are fairly active, though most of the inquiries run less than 100 tons. There was much activity in bolts and nuts in the local market last week, third quarter contracting being reported as very good, with prices remaining the same as those quoted on second quarter contracts.

Warehouse Business.—Local jobbers continue to report good orders in all lines, with prices remaining the same as have been effective for the past few weeks. Stocks are in fair shape.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.50c.; cold-rolled flats, squares and hexagons, 5c.; No. 10 blue annealed sheets, 4.25c.; No. 28 black sheets, 5.35c.; No. 28 galvanized sheets, 6.35c.; No. 9 annealed wire, $3.60 per 100 lb.; common wire nails, $3.60 per keg base.

Coke.—There is little activity in coke, and prices are inclined to lower levels. Connellsville furnace coke is quoted at $5 to $5.25, with foundry at $5.75 to $6.75. Wise County furnace is quoted at $6, and foundry at $7. New River foundry is unchanged at $13, and by-product is still quoted at $10, Connellsville. Holdup and revisions of contracts are becoming more numerous.

Old Material.—The scrap market has become a dealers' affair almost entirely. Dealers who are short of tonnages for June quotas have been offering premiums for steel grades to apply on contracts, and some trading is going on on this basis. Consumers, however, are not buying extensively. We note one sale of 500 tons of melting steel to a district steel plant at $21, delivered, and another of 300 tons at $20, delivered. Machinery cast has been sold at $22.50, delivered. Prices generally are at least 50c. per ton lower than last week. The Norfolk & Western list offers approximately 25,000 tons of various grades.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

	Per Gross Ton	
Bundled sheets	$14.00 to	$14.50
Iron rails	16.50 to	17.00
Relaying rails, 50 lb. and up	29.00 to	29.50
Rails for rolling	18.00 to	18.50
Heavy melting steel	17.00 to	17.50
Steel rails for melting	16.00 to	16.50
Car wheels	17.00 to	17.50
Per Net Ton		
No. 1 railroad wrought	13.50 to	14.00
Cast borings	12.50 to	13.00
Steel turnings	11.50 to	12.00
Railroad cast	18.00 to	18.50
No. 1 machinery cast	22.00 to	22.50
Burnt scrap	14.00 to	14.50
Iron axles	24.50 to	25.00
Locomotive tires (smooth inside)	14.50 to	15.00
Pipes and flues	11.50 to	12.00

St. Louis

Pig Iron Buying from Hand to Mouth—Scrap Steel Declining

ST. LOUIS, June 12.—The market for pig iron remains quiet. Although stocks in hands of melters are low, they are buying only from hand to mouth, showing no interest in third quarter requirements. The melt in the district is keeping up, and concerns are insisting on shipments against contracts. Very few inquiries have been received in the last week. A Kansas melter bought 250 tons. The market for Northern iron is still at $32, Chicago, with some sales reported at $31. The Granite City producer is still quoting $33 to $34 at the furnace, having sold its make for second quarter and into third quarter. The Southern situation is reported easy at $27 although a leading maker is quoting $28.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Birmingham (rail and water), $5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$34.16
Northern malleable, sil. 1.75 to 2.25	34.16
Basic	34.16
Southern fdy., sil. 1.75 to 2.25	32.17

Finished Iron and Steel.—Some good sized contracts were placed during the week for reinforcing bars and structural steel, and several jobs with considerable tonnages are pending. Outside of this the market is quiet. Railroads are buying only small lots. Warehouses are taking only such material as they bought some time ago before the market advanced, and fabricators are

following the same policy. There is some activity in the Oklahoma oil fields.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.45c.; No. 28 black sheets, cold rolled, one pass, 5.20c.; cold drawn rounds, shafting and screw stock, 4.45c.; structural rivets, 4.15c.; boiler rivets, 4.25c.; tank rivets, ⅞ in. and smaller, 50-5 per cent off list; machine bolts, 45-5 per cent; carriage bolts, 40-5 per cent; lag screws, 50-5 per cent; hot pressed nuts, square or hexagon blank, $2.50; and tapped, $2.50 off list.

Coke.—Coal dealers are now closing contracts for fall deliveries of domestic coke with considerably more interest than was shown at this time last year. This is due to a desire to be prepared in the event of another coal strike. The market for both domestic and foundry grades is quiet. Connellsville coke is selling at from $6 to $7.25 at the ovens.

Old Material.—The old material market made further declines the last week. About the only buying is by dealers who have short interests, which will be wiped out soon. Mills are not at all interested in offerings, with the exception of a few specialties. It is expected that mills will not be in the market for the next 30 to 45 days at least, as they are well supplied and consumption will be decreased with the warm weather. Relaying rails are in good demand. Railroad lists show heavy tonnages, as follows: Baltimore & Ohio, 14,000 tons, including 2500 tons of rails and 4000 tons of destroyed steel cars; Wabash, 5500 tons; Missouri-Kansas-Texas, 2000 tons; Mobile & Ohio, 2500 to 3000 tons, including 1000 tons of wheels; Kansas City Southern, 400 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton

Iron rails	$20.00 to $20.50
Rails for rolling	19.25 to 19.75
Steel rails less than 3 ft	19.50 to 20.00
Relaying rails, standard section	37.50 to 29.00
Cast iron car wheels	20.00 to 20.50
Heavy melting steel	17.50 to 18.00
Heavy shoveling steel	17.00 to 17.50
Frogs, switches and guards cut apart	18.00 to 18.50

Per Net Ton

Heavy axles and tire turnings	13.25 to 13.50
Steel angle bars	15.75 to 16.25
Iron car axles	26.00 to 26.50
Steel car axles	19.00 to 19.50
Wrought iron bars and transoms	20.00 to 20.50
No. 1 railroad wrought	16.00 to 16.50
No. 2 railroad wrought	15.50 to 16.00
Railroad springs	20.00 to 20.50
Cast iron borings	13.00 to 13.50
No. 1 busheling	15.50 to 16.00
No. 1 railroad cast	18.50 to 19.00
No. 1 machinery cast	19.50 to 20.00
Railroad malleable	18.50 to 19.00
Machine shop turnings	12.00 to 12.50
Champion bundled sheets	11.00 to 11.50

Buffalo

Interest of Buyers Increases, but the Pig Iron Prices Are Weaker

BUFFALO, June 12.—Inquiry for pig iron has appeared in a more encouraging volume and buyers who have been indifferent for many weeks are showing more interest. This development has not reached the stage where any big sales have been made but may be summed up in the statement that buying is a step nearer. In the face of this, prices are weaker; $29.50 base has been the consideration only in a few cases where immediate delivery entered into the transaction and most sales are at $29. All sellers encounter rumors of $28.50 being made in competition but confirmation is lacking. The average inquiry in the district is 100 tons and a few for 200 tons are out; from outside the district several 500-ton inquiries have come, but Buffalo furnaces cannot touch these. The largest producer's position with reference to third quarter is unchanged and it is unlikely there will be any third quarter business taken by this interest. This furnace does not find any improvement in inquiry, but attributes it to the fact that the trade knows it is out of the market. Furnace operations are not likely to be curtailed in the near future because of the lack of new business. With one out of the market, the remaining four in the merchant field have satisfactory tonnages now on the books.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$30.00 to $30.50
No. 2X foundry, 2.25 to 2.75 sil.	29.50 to 30.00
No. 2 plain, 1.75 to 2.25 sil.	29.00 to 29.50
Basic	28.00 to 29.00
Malleable	28.00 to 29.00
Lake Superior charcoal	37.28

Finished Iron and Steel.—Rail purchases, some of which tonnages will be rolled at the Lackawanna mills of the Bethlehem Steel Co., have served to give buyers greater confidence. Specifications on bars and shapes are uniformly good with all sellers but new business is not coming in in the same encouraging fashion. Curtailment of certain large construction enterprises had a depressing effect, but this has passed; there is no dearth of small building, and small shapes, pipe and some wire business entering into this field is moving briskly. The prevailing bar price is 2.40c. for third quarter and shapes and plates at 2.50c. The 2.50c. price on bars has not been done recently.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue annealed sheets, No. 10 gage, 4.30c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5.10c.; cold rolled round shafting, 4.45c.

Old Material.—Heavier rejection of steel and a lesser degree of interest in purchases are the outstanding characteristics. Most of the large orders have been filled and dealers are practically at a standstill. One big consumer has held up all shipping for 10 days because of the large amount of incoming scrap. There have been no sales of importance.

We quote, f.o.b. gross ton Buffalo, as follows:

Heavy melting steel	$20.50 to $21.50
Low phos., 0.04 and under	25.00 to 26.00
No. 1 railroad wrought	19.00 to 20.00
Car wheels	21.00 to 22.00
Machine shop turnings	16.00 to 17.00
Cast iron borings	19.00 to 20.00
No. 1 busheling	18.00 to 19.00
Stove plate	18.00 to 19.00
Grate bars	17.00 to 18.00
Bundled sheet stampings	15.00 to 16.00
No. 1 machinery cast	23.00 to 24.00
Hydraulic compressed	18.50 to 19.50
Railroad malleable	24.00 to 25.00

Birmingham

Alabama Furnaces Stick to $27 Despite the Tennessee Prices

BIRMINGHAM, ALA., June 12.—What will be the price of Birmingham furnace iron when real buying starts is admitted doubtful. In the absence of a real buying movement and with nothing to gain by price reduction on the little business going, no Alabama furnace interest was selling iron below $27 base at close of last week. A Nashville stove concern secured several hundred tons of Tennessee iron at $25.50 to $26 base. There is not much of that iron and Birmingham furnaces are not always influenced by Tennessee prices. A deal of 3700 tons of Tennessee iron at $25.50 base included iron off in sulphur and silicon. That was the largest transaction and occurred about the first of the month. Late in the week a nearby Southern consumer took 500 tons Birmingham iron at $27 and several lots of 100 to 300 tons were booked for Middle Western delivery at this base along with numerous car lots. A large Western consumer has asked prompt delivery of 3000 tons third quarter iron. Stocks May and June 1 on Alabama yards were as follows: Foundry, 22,500 and 22,100; machine cast, 3800 and 1700; warrants, 600 and 100; basic, 12,000 and 10,000; totals, 39,000 and 33,900. The largest individual merchant stocks were 13,000 and next largest 3000 and 2000, the rest being scattering. The reduction of stocks was coupled with largest make of the year and makes a new low. The Woodward Iron Co. is running one stack for the present on basic for Kentucky and Southern consumption, three

other stacks being on merchant iron. The Sloss-Sheffield Steel & Iron Co. continues preparation to resume at a seventh stack in Sheffield about June 20.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$27.00
Basic	26.00
Charcoal, warm blast	34.00

Finishing Mills.—The slight decrease in new business for wire drawing mills is regarded as seasonal. Nails, however, are active as ever. Steel bars are $2.65 to $2.70, f.o.b. Birmingham. All steel mills remain at capacity. Japan took another 5000 tons of rails, sheets, bolts, nuts and rivets together with additional heavy tonnage of sulphate of ammonia via Mobile last week.

Cast Iron Pipe.—Pressure pipe is reported easier. The base of $49 was underquoted to $47 in recent Southern bidding on lots under 1000 tons. The United States Cast Iron Pipe & Foundry Co. has booked 2000 tons for Flint, Mich., and 6000 for Portland, Ore. Pacific Coast ports took 4500 tons of pipe and other iron and steel products via Mobile last week. Sanitary pipe is quiet at $70 and that is understood to be shaded.

Coal and Coke.—Coke rules with obstinacy at $9 to $10 for spot. Coal production continues 20,000 tons a week under peak production of April.

Old Material.—Cast grades have been fairly active and firm, but steel has not been strong and large buyers have shaved the market.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Old steel rails	$18.00 to $20.00
No. 1 steel	16.00 to 18.00
No. 1 cast	23.00 to 24.00
Car wheels	23.00 to 24.00
Tramcar wheels	22.00 to 23.00
Stove plate	17.00 to 18.00
Cast iron borings	12.00 to 13.00
Machine shop turnings	12.00 to 13.00

Boston

Pig Iron Market Quieter with the Price Trend Still Downward

BOSTON, June 12.—Reports of an inquiry involving about 6000 tons in this market are somewhat misleading. The H. P. Smith Co., Westfield, Mass., heating appliances, which is covered through the third quarter, is sounding out the market without specifying tonnage or time iron will be needed. Testing has been going on about a fortnight. A new 1923 record for quietness was hung up in this market the past week. Not all eastern Pennsylvania iron is $29 base with $1 differentials, some being $29.50 with 50c. differentials, making the general No. 2X price $30 furnace or $33.65 delivered. Buffalo openly holds at $29.50 base, but iron from that district is offered at $28.50 or $34.51 delivered, in competition with No. 2 plain western Pennsylvania. Fairly heavy stocks of No. 2 plain are reported in the western Pennsylvania district, while holdings of No. 2X are small. Virginia iron is offered at $33.42 delivered base, as against $33.92 a week ago, and unconfirmed reports are that foreign, New England unsold stocks of which amount to about 6000 tons, is offered at low prices with extended bill datings. Alabama iron apparently is pegged at $27 base.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$33.65
East. Penn., sil. 1.75 to 2.25	$32.65 to 33.15
Buffalo, sil. 2.25 to 2.75	33.91 to 34.91
Buffalo, sil. 1.75 to 2.25	33.41 to 34.41
Virginia, sil. 2.25 to 2.75	33.92 to 34.92
Virginia, sil. 1.75 to 2.25	33.42 to 34.42
Alabama, sil. 2.25 to 2.75	37.10
Alabama, sil. 1.75 to 2.25	36.60

Cast Iron Pipe.—The inability of foundries to guarantee deliveries on small pipe within four to six months is curtailing business in this territory. Consumers, already covered, are pressing foundries for shipments, but the movement into New England is comparatively light. Marblehead, Mass., recently called for bids on approximately 200 tons of 16-in. pipe. The contract has not been awarded on account of late deliveries, the best dating given being four months. The city of Woburn, Mass., is putting out feelers on 100 tons of 6-in. pipe. Haverhill, Mass., has awarded 100 tons of 6, 10 and 12-in. pipe to the Warren Foundry & Pipe Co. Cast iron pipe, in car lots, f.o.b. common Boston rate points, is as follows: 4-in., $70.10 a ton; 6-in. to 14-in., inclusive, $65.10; 16-in. and up, $63.10.

Coke.—New England by-product foundry coke makers are pressing consumers for specifications against contracts with indifferent results, most melters having sufficient fuel on hand for nearby requirements. On the other hand deliveries by producers are not as prompt as might be expected under the circumstances. Connellsville 72-hr. fuel continues to sell in a small way at former prices. Both the New England Coal & Coke Co. and the Providence Gas Co. quote $14 delivered within the $3.10 freight zone.

Old Material.—A further shading on borings and turnings, averaging 50c. a ton, is noted, but old material prices otherwise hold steady. Machine shop turnings and mixed borings and turnings were taken by brokers at $12 on cars the past week. Orders are now well covered. Car lots of chemical borings were taken by gas companies and a New Jersey concern is making tentative offers in this territory for small tonnages. The demand for heavy melting steel at $14.50 on cars is fair, yet sales are few and far between, apparently because of limited holdings. A New England rolling mill has cancelled orders for several cars of shafting because of a slowing down in the demand for bars. Foundries show no interest in machinery cast and stove plate. A fairly good tonnage of the latter is required for eastern Pennsylvania consumption. Bids of $13 f.o.b. cars have failed to bring out material, however.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$24.50 to $25.00
No. 2 machinery cast	22.50 to 23.00
Stove plate	13.00 to 14.00
Railroad malleable	26.00 to 26.50
Street car wheels	23.00 to 24.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$14.50 to $15.00
No. 1 railroad wrought	17.00 to 17.50
No. 1 yard wrought	15.50 to 16.00
Wrought pipe (1-in. in diam., over 2 ft. long)	12.00 to 12.50
Machine shop turnings	12.00 to 12.50
Cast iron borings, rolling mill	13.00 to 13.50
Cast iron borings, chemical	14.00 to 14.50
Blast furnace borings and turnings	11.50 to 12.00
Forged scrap and bundled skeleton	12.00 to 12.50
Shafting	19.00 to 20.00
Street car axles	19.00 to 20.00
Rails for rerolling	16.00 to 17.00

Philadelphia

Buyers Are Still in a Waiting Mood and There Is Little Business

PHILADELPHIA, June 12.—Buyers of steel and pig iron are still in a waiting mood, and there is very little business aside from some railroad buying of plates, shapes and bars for car repairs. The Pennsylvania and Baltimore & Ohio roads have placed fairly good tonnages for specification over the next two months. Only a little improvement in the demand for pig iron has followed the recent settling of prices to lower levels, buyers apparently expecting still lower quotations.

Pig Iron.—While demand for foundry pig iron has been somewhat better in the past week than in the week previous, it is evident to sellers that consumers are not yet ready to place their third quarter requirements or any considerable part of them. Orders in the past week have totaled a few thousand tons, mostly for June-July shipment. It is believed that the policy of buyers will be to cover for only about 30 days ahead,

as present indications point to an ample supply of iron. Consumers are taking iron in freely on their second quarter contracts, the only requests for holding back shipments being due to the inability of foundries to use all of the iron they had contracted for because of labor shortage and poor performance of labor. There is a good deal of complaint from foundrymen on this score and with the heated period at hand the situation will probably be worse over the next two or three months. Reports which seem to emanate from buyers are to the effect that the $29 base price on foundry iron is not holding with all eastern Pennsylvania furnaces and that one or two have quoted as low as $28, furnace. There has been no further demand for basic iron. One of the important sales of the week was 1000 tons of foreign low phosphorus iron to a Philadelphia company.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$29.76 to $30.64
East. Pa. No. 2X, 2.25 to 2.75 sil.	30.76 to 31.64
East. Pa. No. 1X	31.76 to 32.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	32.17 to 33.17
Virginia No. 2X, 2.25 to 2.75 sil.	33.17 to 34.17
Basic delivered eastern Pa.	28.14
Gray forge	28.00 to 29.00
Malleable	31.14 to 31.64
Standard low phos. (f.o.b. furnace)	31.00 to 35.00
Copper bearing low phos. (f.o.b. furnace)	33.00

Foreign Pig Iron

All prices f.o.b. cars Philadelphia, duty paid.

Continental foundry, 1.80 to 2.50 sil.	$29.00
Continental foundry, 2.50 to 3.25 sil.	30.00
Low phos. copper free, guar. not over 0.035 per cent phos.	$35.00 to 36.00
Continental, phos. 1.50; sil. 2 to 3	29.50

Ore.—Iron ore imports last week included 14,163 tons from Sweden and 6201 tons from Algeria. Manganese ore imports were 7441 tons, all from West Africa.

Ferroalloys.—There is no change in the prices quoted for ferromanganese, namely $125, either seaboard or furnace, for foreign or domestic product. Spiegeleisen is more freely obtainable for early delivery at $45, furnace, for the 19 to 21 per cent grade.

Semi-Finished Steel.—Quotations for billets are unchanged at $45 for open-hearth rerolling quality and $52.50 to $55, Pittsburgh, for forging quality.

Plates.—Youngstown mills have figured in the Eastern plate market more extensively during the past week than at any time in months. Two mills in that district are quoting 2.50c., Pittsburgh, for shipments within two or three weeks, and have booked some business and have made it more difficult for Eastern mills to get orders at 2.60c., Pittsburgh, the figure which most of them are quoting. One Eastern mill has reduced its price on sheared plates from 2.65c. to 2.60c. and on universal plates it will accept 2.50c. Other mills will meet these prices. The Pennsylvania Railroad has ordered from 5000 to 10,000 tons of plates for June-July specification, in addition to a smaller tonnage of shapes and bars, and the Baltimore & Ohio is reported to have placed orders for a few thousand tons for early specification.

Structural Material.—While there are some projects pending in the Philadelphia district, it has been difficult to get action for one reason or another. In some instances building projects are held up owing to the more critical attitude of the banks on loans. Eastern shape mills are quoting 2.50c., Pittsburgh, for early deliveries. There seems to be no deviation from this price anywhere. A relatively small amount of business is being placed.

Bars.—Reports of price shading on concrete reinforcing bars are not fully confirmed, but it is believed that one or two rerolling mills have made sales at 2.30c. and 2.35c., Pittsburgh. All of the larger mills adhere to 2.40c., Pittsburgh, on all forms of steel bars. Bar iron continues to be quoted at 2.40c. to 2.50c., Pittsburgh.

Sheets.—Business in sheets has dropped to a minimum. Some consumers are getting heavy shipments on their contracts. The market is slightly weak and there are reports of price concessions, particularly on black sheets, sales having been made, it is said, at 3.75c., Pittsburgh.

Warehouse Business.—Philadelphia warehouses have made an adjustment of prices on steel out of stock for out-of-town trade. For example, steel bars, which are quoted at 3.55c. per lb. for local delivery, are now quoted at 3.47c., f.o.b. warehouse, to out-of-town trade, the buyer paying the freight. Proportionate reductions have been made in all other products. Demand for steel out of stock continues at a high rate.

Soft steel bars and small shapes, 3.55c.; iron bars (except bands), 3.55c.; round edge iron, 3.75c.; round edge steel, iron finished, 1½ x ½ in., 3.75c.; round edge steel planished, 4.55c.; tank steel plates, ¼ in. and heavier, 3.65c.; tank steel plates, ⅜ in., 3.95c.; blue annealed steel sheets, No. 10 gage, 4.25c.; black sheets, No. 28 gage, 5.15c.; galvanized sheets, No. 28 gage, 6.25c.; square twisted and deformed steel bars, 3.65c.; structural shapes, 3.65c.; diamond pattern plates, ¼-in., 5.40c.; ⅜-in., 5.60c.; spring steel, 5c.; round cold-rolled steel, 4.35c.; squares and hexagons, cold-rolled steel, 4.85c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.75c.; narrower than 1 in., all gages, 5.25c.; steel bands, No. 12 gage to ⅜-in., inclusive, 4.35c.; rails, 3.55c.; tool steel, 8.50c.; Norway iron, 7c.

Old Material.—For the first time in several weeks there is little change in old material prices this week. With one or two minor exceptions, prices continue at about last week's levels. There is very little business.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$18.00 to $19.00
Scrap rails	18.00 to 19.00
Steel rails for rolling	21.00 to 22.00
No. 1 low phos., heavy 0.04 and under	25.00 to 26.00
Cast iron car wheels	23.00 to 24.00
No. 1 railroad wrought	23.00 to 24.00
No. 1 yard wrought	20.00 to 21.00
No. 1 forge fire	17.00 to 18.00
Bundled sheets (for steel works)	16.50 to 17.00
No. 1 busheling	18.00 to 19.00
Mixed borings and turnings (for blast furnace use)	16.00 to 17.00
Machine shop turnings (for steel works use)	16.50 to 17.00
Machine shop turnings (for rolling mill use)	17.00 to 17.50
Heavy axle turnings (or equivalent)	18.00 to 19.00
Cast borings (for steel works and rolling mills)	17.00 to 17.50
Cast borings (for chemical plants)	20.00 to 21.00
No. 1 cast	22.00 to 23.00
Heavy breakable cast (for steel plants)	19.00 to 20.00
Railroad grate bars	18.50 to 19.00
Stove plate (for steel plant use)	17.00 to 18.00
Railroad malleable	22.00 to 24.00
Wrought iron and soft steel pipes and tubes (new specifications)	15.00 to 16.00
Shafting	24.00 to 26.00
Steel axles	24.00 to 26.00

Cleveland

Slight Increase in Pig Iron Buying Fails to Develop Into a General Movement

CLEVELAND, June 12.—Although over 6,500,000 tons of Lake Superior ore was shipped from the mines in May, considerable ore was taken from Lake Erie docks during that month and dock stocks were reduced on June 1 to 4,347,271 gross tons as compared with 4,857,542 tons on May 1. The dock balance June 1, last year, was 6,493,045 tons. Receipts at Lake Erie ports during May were 4,264,454 tons and shipments from these ports were 4,041,956 tons. Shipments for the season from Lake Erie ports were 5,894,678 tons as compared with 1,725,139 tons during the same period last year. The ore market continues very dull, although one seller during the week booked two orders each for 5000 tons.

Pig Iron.—The slight spurt in activity noted last week did not prove a forerunner of a general buying movement, for the market has again settled down to a very light volume of business. Sales during the week were confined to purchases by small consumers mostly in lots of 200 tons and under. Very few consumers in this territory have purchased their third quarter iron and foundrymen are showing a very cautious attitude in regard to making commitments. Inquiry is light. One

large consumer is feeling the market on prices and is expected to purchase 20,000 tons of basic and malleable iron shortly, but has not yet sent out a definite inquiry. Aside from the development of further weakness in southern Ohio, where foundry and malleable iron is freely offered at $28, there is little change in the price situation. In the Valley district the common price is $29, although a few sales for nearby shipment are reported at $29.50. A Cleveland consumer purchased a small lot of foundry iron from a New York furnace at $29 Buffalo. One lake furnace continues to hold to $31 and reports small lot sales of about 1000 tons at that price. The inquiry from Columbus, Ohio, for 1500 tons of malleable iron noted last week brought out quotations of $29 and $30 from lake furnaces, but prices named by southern Ohio furnaces with slightly lower freight rate were from $1 to $2 below lake furnace quotations. Shipments continue heavy. A favorable feature of the market is that the melt is holding up well and shipping orders from automobile foundries for June show only a slight falling off as compared with May.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$27.50 to $28.00
Northern No. 2 fdy., sil. 1.75 to 2.25	30.77 to 31.65
Southern fdy., sil. 1.75 to 2.25	32.00 to 33.00
Malleable	30.77 to 31.65
Ohio silvery, 8 per cent	42.52
Standard low phos., Valley furnace	36.00

Semi-Finished Steel.—The demand for sheet bars is easier. One producer is quoting Bessemer sheet bars at $42.50, Pittsburgh, but on open-hearth sheet bars mills appear to be holding closely to $45. Shading of $2 to $3 is reported from the $55 price on forging billets.

Finished Iron and Steel.—Specifications are holding up well and some of the mills report a slight improvement in orders. The better demand is mostly for structural steel for which some fabricators and other consumers are placing stock orders. Steel bars are quiet, but there is a fair demand for plates in small lots. The Pere Marquette Railroad has revived an inquiry that it sent out a few months ago for two barges, each requiring 2600 tons of steel. This railroad has now definitely decided to place at least one of these boats for which bids will be taken June 30. This is the first lake boat-building business that has developed in several months. One lake shipyard has taken quotations on 10,000 tons of plates for two freight boats, but has no inquiry for these, having secured the steel prices simply to attempt to find a buyer by naming a fixed price for completed boats. Some of the forge shops engaged in automobile work have slowed down operations, but generally the demand for steel from the automobile industry is holding up well. Some of the automobile companies have recently bought round lots of alloy steel for the third quarter. However, it seems to be the general disposition of motor car builders to hold off and buy from hand to mouth, at least until they ascertain to what extent the demand for cars keeps up after July 1. Prices are holding firm at 2.40c. for steel bars and 2.50c. for plates and structural material. Premium business is still in evidence in plates for early shipment which range up to 2.70c., Eastern mill. One local mill has reduced its plate price $1 a ton to 2.60c., and another is still holding to 2.65c. The building field continues quiet.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 9 galvanized wire, 3.70c.; No. 9 annealed wire, 3.25c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.90c.; No. 10 blue annealed sheets, 3.90c. to 4.06c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.60c.

Sheets.—Quotations of 3.75c. on black and 4.75c. on galvanized sheets have been made by one Valley district mill that needed June tonnage, but these prices are reported to have been withdrawn and the market appears to be holding well to 3.85c. and 5c. On blue annealed sheets the 3.25c. price has about disappeared. Some mills are getting well caught up on orders and there is evidence that the regular 3c. price might be shaded on a desirable inquiry. Light plate mills are no longer attempting to get above 3c. for No. 10 gage. We note the sales of 600 tons of black sheets in two or three lots for export to Canada.

Reinforcing Bars.—New demand for reinforcing bars has become light. The only inquiry is for 150 tons for the Hospital Clinic, Cleveland. Rail steel bars are not firm, with 2.40c. as the common quotation.

Coke.—Some producers have named $7.25 to $7.50 as prices for standard Connellsville foundry coke for the third quarter and last half and a few contracts have been placed at those prices. Prompt shipment Connellsville foundry coke is quoted at $6.50 to $7.50 for the better grades.

Bolts, Nuts and Rivets.—Some of the bolt and nut manufacturers have announced that they will take contracts for the third quarter at the prices at which most of the second quarter contracting was done, or at about 10 per cent below published prices, but no sales are reported for that delivery. Specifications are holding up well. Some third quarter inquiries for rivets are coming out and these will probably be held for that delivery at the current prices of 3.25c. for structural and 3.35c. for boiler rivets. These prices are being shaded by some makers for current orders. Rivet specifications are heavy and some new business is coming from car builders and oil companies.

Old Material.—The market is holding close to recent price levels and while strength is lacking the extreme weakness that was in existence for several weeks seems to have disappeared. There is no buying by the mills in the Cleveland and Valley districts and in the absence of sales all quotations are dealers' prices. Small lots of heavy melting steel on cars were sold during the week as low as $18.50, or a 50c. decline from the previous week. However, dealers are asking $21.50 from consumers and it is doubtful if a mill could secure a quotation much, if any, lower than that.

We quote per gross ton f.o.b. Cleveland as follows:

Heavy melting steel	$18.50 to $19.00
Rails for rolling	22.00 to 22.50
Rails under 3 ft	20.50 to 21.50
Low phosphorus melting	21.50 to 22.50
Cast borings	17.00 to 17.25
Machine shop turnings	16.75 to 17.00
Mixed borings and short turnings	16.50 to 16.75
Compressed sheet steel	18.00 to 18.50
Railroad wrought	16.50 to 17.00
Railroad malleable	25.00 to 25.50
Light bundled sheet stampings	12.75 to 13.00
Steel axle turnings	17.75 to 18.00
No. 1 cast	23.50 to 24.00
No. 1 busheling	16.00 to 17.00
Drop forge flashings	16.75 to 17.00
Railroad grate bars	17.00 to 18.00
Stove plate	17.00 to 18.00
Pipes and flues	13.00 to 13.50

The Excello Tool & Mfg. Co., Detroit, manufacturer of high speed grinding spindles, has taken a long term lease on 18,000 sq. ft. of manufacturing space in the building on the corner of East Grand Boulevard and Helen Avenue, Detroit. This company was formerly located at 1214 Beaubien Street and was forced to seek larger quarters due to increased business.

The Ford Motor Co. will attempt to fill an order list for 311,000 cars and trucks for delivery during the month of June. Production for the month has been set at 6700 vehicles per day and every effort will be made to increase the output to meet the demands of the Ford dealers throughout the country.

Remarkable improvement in business of Steel & Tube Co. of America is reflected in report for the first quarter of 1923, which shows net profit of $2,207,415 after taxes and all charges. Allowing $294,742 preferred dividend for the quarter, this leaves $1,912,673 available for common stock, or about $1.97 a share on the 967,330½ shares outstanding. For 1922 company showed a net profit of $472,420.

JAPAN INQUIRES FOR RAILS

City, Imperial and Private Railroads Issue Tenders—Two Large Oil Companies Ask for Tin Plate

NEW YORK, June 12.—The export situation shows but little change, the larger part of present business still being from large Japanese companies and official and semi-official Japanese Government sources. Among current inquiries of this nature is one from the Imperial Government Railways for about 15 miles of 75-lb. rails. Another railroad inquiry issued some time ago and but recently revived is for 60 miles of 75-lb. rails and 5 miles of 60-lb. rails for the Odawara Electric Railway, not yet constructed, for delivery up to the spring of 1925. The recent tender of Tokio municipality for about 3000 tons of high T girder rails, has been awarded to a New York export house. Among recent tin plate inquiries is one from the Nippon Oil Co. for about 9000 base boxes of oil can size and a smaller tonnage, 5300 boxes, said to be from the Ogura Oil Co., specifying 4000 boxes of 14 x 18 in. and 1300 boxes of 10 x 20 in. A number of small inquiries for structural steel are reported to be current in addition to two large tenders, one for 800 tons and the other for 1000 tons. The 200 tons of electrical sheets asked for by the Hatchi Engineering Co. are reported placed with an exporter in this country who placed them with the Steel Corporation.

The Chinese market continues quiet with potential buyers of wire shorts still refraining from purchases at present prices. A fair degree of interest is manifested by merchants in second-hand plates, both punched and plain, but $28 to $30 per ton seems to be the limit of Chinese offering prices at present. Even less than normal business in tin plate and galvanized sheets is reported by exporters to Chinese markets. There is some inquiry for casting copper, stated by the purchaser to be for minting purchases.

CHINESE MARKET QUIET

Mint Copper Stocks Low—Large Stocks of Galvanized Sheets—Tin and Lead Quiet

SHANGHAI, CHINA, May 17.—Chinese mints are making purchases of copper cautiously, in view of the recent price recessions in the markets in America and London. Chinese buyers generally display nervousness when prices recede, and seem to expect that nothing can arrest a decline. The same attitude is evident when the market takes a sharp turn upward and there is a rush to buy. In the recent price advance the Chinese dealers were caught napping and the rapidity with which prices rose induced the buyers to await a decline. Although in many iron and steel products recessions have been substantial there is still little inclination to buy, the opinion being general that values will decline still further.

The mints are continuing to make limited purchases of copper. During the past week transactions totaled only 200 to 300 tons, while for the first half of May the amount of new contracts did not exceed 500 tons. This is about sufficient for two months' requirements of the mints, and under the circumstances heavier buying of copper is expected in the near future. It is noteworthy that at present the four mints are confining their purchases to refined and cast copper instead of electrolytic copper, which was formerly used. This change has been made for the purpose of economy. When the mints used electrolytic copper a percentage of alloy had to be employed in the minting of copper coins. Now, with the higher price being commanded in the American market for electrolytic copper, the mints have decided to use casting copper which produces the same fineness of coin and eliminates the necessity of alloying. Stocks of cast copper held in Shanghai are about 200 tons and of electrolytic copper about 50 tons. Shanghai supplies of electrolytic are the lowest on record for many years, and as a result the Chinese mints may soon be in the American market for supplies.

Stocks of galvanized sheets in Shanghai have been increasing, being estimated today at a thousand tons. At the beginning of this year Chinese dealers were extremely active in buying galvanized sheets because of diminished supplies, and a number of large contracts were placed. Deliveries on these contracts have been arriving steadily during the month at Shanghai. In the meantime there has been a dearth of buying from the North and up-country centers, and stocks have been accumulating. In addition, the unsettled political situation has militated against merchants placing orders for their full requirements.

The large tin consuming district of Shaoshing has been entirely out of the market for some time and tin is therefore quiet. Shanghai stocks of Hongkong tin are estimated at about 1000 slabs, and the quotation is 72 taels per picul. Straits tin is quoted at about 85 taels per picul.

Lead has been declining, and buyers are waiting for still lower prices. The present stock of 1000 tons is about sufficient to cover the needs of two months. Buyers are offering 10.20 taels per picul while sellers demand 11 taels, with the result that business is difficult to transact.

Canadian Scrap Market

TORONTO, ONT., June 11.—Consumers show but little interest in their iron and steel scrap requirements in the Toronto market and as a result local dealers say that orders closed during the past week or ten days have been limited to small tonnages for immediate use. Despite the fact that present demand is small, dealers say they have a good volume of business on their books covering second quarter needs and are busy making deliveries on these orders. In the Montreal market the demand for iron and steel scrap is fairly strong.

Dealers' buying prices are as follows:

	Toronto	*Montreal*
Gross Tons		
Steel turnings	$13.00	$14.00
Machine shop turnings	13.00	13.00
Wrought pipe	14.00	12.00
Rails	17.00	15.50
No. 1 wrought scrap	18.00	15.00
Heavy melting steel	16.00	15.00
Steel axles	18.00	18.00
Axles, wrought iron	21.00	24.00
Net Tons		
Standard car wheels	18.00	17.00
Malleable scrap	18.00	17.00
Stove plate	18.00	18.00
No. 1 machinery cast	22.00	24.00

Detroit Scrap Still Weak

DETROIT, MICH., June 12.—The market on old material continues to show weak spots with dealers buying short and melters confining their purchases to current needs. In a few instances dealers have asked for bids on tonnage on their yards. Prices are materially the same as quoted a week ago.

The following prices are quoted on a gross ton basis f.o.b. cars, producers' yards, excepting stove plate, automobile and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel	$18.50 to $19.50
Shoveling steel	18.50 to 19.50
No. 1 machinery cast	22.00 to 24.00
Cast borings	14.50 to 15.00
Automobile cast scrap	25.00 to 27.00
Stove plate	19.00 to 20.00
Hydraulic compressed	17.50 to 18.00
Turnings	14.00 to 14.50
Flashings	13.75 to 14.25

British Iron and Steel Market

Pig Iron Consumers Waiting for Lower Prices—General Situation Poor, with Some Works Closing Down—More Krupp Works Seized by French—Continental Conditions Improving

(By Cable)

LONDON, ENGLAND, June 12.

Pig iron is easy and there has been no revival of buying so far. Consumers are waiting for still lower prices. Continental inquiry is small and the makers' position is difficult, owing to high costs, though fuel is showing a downward tendency.

Hematite also is weaker.

Finished iron and steel is dull. There have been some good inquiries about, but little business resulting from them. Some Scotch works are contemplating closing down until after the annual holidays. The Atlas Forks, at Springburn, Glasgow, of the North British Locomotive Co., Ltd., has been closed indefinitely. Prices generally are maintained except on plates, which are weaker on account of poor export demand.

Continental material is more active on the resumption of traffic on the Belgian railroads. Prices are tending lower.

French forces have occupied the Kruppsche Verwaltung der Hermannshütte works at Neuwied-am-Rhein and blast furnaces at Mühlhofen near Engers-am-Rhein, owing to non-payment of the coal tax. Failing payment, sale of the works at auction is threatened.

The German Government is waiving the import duty, under certain conditions, on pig iron and steel imported into unoccupied territory since Feb. 1. There is a big strike at mines and works in Upper Silesia.

In Luxemburg the position is improving and, thanks to the resumption of Belgian coke deliveries, and the quota from the Ruhr, it is expected that some fresh furnaces will be blown in shortly.

The tin plate market is slightly easier. More works inclined to accept the minimum price. Export business is quieter.

Some business is being done in galvanized sheets for India and South America has made small purchases. Other markets are quiet. Less than £19 (3.92c. per lb.) has been accepted for No. 24 gage corrugated galvanized sheets.

Black sheets are quiet, with no change in price.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.62 per £1, as follows:

Durham coke, delivered	£2	3s.				$9.93	
Bilbao Rubio ore†	1	4				5.54	
Cleveland No. 1 foundry	6	7½	to £6	9s.		29.45 to	$29.80
Cleveland No. 3 foundry	5	17½				27.14	
Cleveland No. 4 foundry	5	15				26.56	
Cleveland No. 4 forge	5	12½				25.98	
Cleveland basic	6	0				27.72	
East Coast mixed	5	17½				27.14	
Ferromanganese	18	0				83.16	
Ferromanganese*	20	0				92.40	
Rails, 60 lb. and up	10	0	to 10	10		46.20 to	48.51
Billets	8	15	to 9	15		40.42 to	45.04
Sheet and tin plate bars, Welsh	9	2½				42.15	
Tin plates, base box	1	3⅛	to 1	3½		5.34 to	5.43
						C. per Lb.	
Ship plates	9	15	to 10	5		2.01 to	2.11
Boiler plates	12	10	to 13	0		2.58 to	2.68
Tees	10	10	to 11	0		2.16 to	2.27
Channels	9	15	to 10	5		2.01 to	2.11
Beams	9	10	to 10	0		1.96 to	2.06
Round bars, ⅝ to 3 in.	11	5	to 11	15		2.32 to	2.42
Galvanized sheets, 24 g.	19	0	to 19	5		3.92 to	3.97
Black sheets, 24 gage	13	15	to 14	5		2.83 to	2.94
Black sheets, Japanese specifications	15	5				3.14	
Steel hoops	11	0	& 13	0*		2.27 &	2.68*
Cold rolled steel strip, 20 g.	17	7½				3.58	
Cotton ties, Indian specifications	15	0				3.09	

*Export price. †Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

Foundry pig iron:						
Belgium, June, July	£5	15s.	to £6	0s.	$26.56 to	$27.72
France, June, July	5	15	to 6	0	26.56 to	27.72
Luxemb'g, June, July	5	15	to 6	0	26.56 to	27.72
Billets:						
Belgium, June, July	6	15			31.18	
Merchant bars:					C. per Lb.	
Belgium, July	7	2½			1.47	
Luxemburg, June	7	2½			1.47	
Joists (beams):						
Belgium, July	7	5			1.49	
Luxemburg	7	7½	to 7	10	1.52 to	1.54
¼-in. plates:						
Belgium, June, July	8	5			1.70	
⅜-in. plates:						
Luxemburg	7	7½			1.52	

New Business Disappointing — Belgium Trying to Secure Orders—Record Coal Output—Boilermakers' Strike Troublesome

LONDON, ENGLAND, May 31.—A new record in the production of coal in the United Kingdom was established during the week ended May 19, when 5,796,600 tons was mined, compared with 5,776,600 tons in the second week of April, the previous high record.

Business in the iron and steel markets continues on a disappointing scale. The whole position is one of costs of production and, as these have not come down, neither pig iron nor steel makers can reduce prices except on a minor and unimportant scale. The stoppage of work for the Whitsun holiday interfered with the trade, but when business was resumed the Cleveland market showed a weak tone and by the end of the week values of No. 3 G. M. B. had fallen 5s. No. 1 Cleveland continues in short supply and, for this grade of iron, sellers are firm at 130s. The demand from the continent has dwindled, as has also that from America, but the continent is again endeavoring to compete here with very little success, because for foundry iron about 115s. to 117s., f.o.b. Antwerp, is asked. There are at the present time about 170 furnaces actually in blast in England and in Wales, while in Scotland 46 are blowing, which makes a total of 216 out of 432 furnaces in the entire United Kingdom. The home demand for steel being quiet, not much has been moving in hematite, and here, too, the price has had to give way, East Coast mixed numbers being obtainable at about 120s. to 122s. 6d.

New business in finished iron and steel is confined to small orders here and there. For many weeks, however, most of the large works were booking substantial contracts, mainly for the continent, with shipments spread over a period and they are now completing these; consequently, there is no immediate pressure for new orders and prices have not had to give way, except to about 5s. per ton, which concessions can be obtained from some of the smaller makers.

Shipyards are naturally affected by the strike of boilermakers, but in anticipation of a satisfactory outcome of the conference arranged between representatives of the Shipbuilding Employers' Federation and the Boilermakers' Society, some new contracts for motor ships were placed with Clyde works. The conference, however, has proved abortive and in Scotland there are fears that rolling programs will have to be curtailed.

The continent, particularly Belgium, is making strong attempts to secure business and quoting prices which are below those quoted here, but even this does not attract buyers either at home or abroad, except for urgent requirements, and it is difficult to forecast the outcome of the continental position. Shipments have, of course, been held up by the troubles at Antwerp, throwing deliveries further back; practically no supplies are coming forward from the French occupied area of Germany, due chiefly to lack of transport facilities.

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb.....2.50c.

Structural Material

Beams, channels, etc., base, per lb.....2.50c.
Sheet piling .....2.65c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.40c.
Soft steel bars, screw stock quality.....$3 per ton over base
Reinforcing steel bars, base.....2.40c.
Refined iron bars, base, per lb.....3.25c.
Double refined iron bars, base, per lb.....4.85c. to 5.00c.
Stay bolt iron bars, base, per lb.....8.00c. to 8.50c.

Hot-Rolled Flats

Hoops, ordinary gages and widths, base, per lb.....3.30c.
Hoops, light gage, under 1 in. wide.....3.50c.
Bands, base, per lb.....3.30c.
Strips, base, per lb.....3.30c.
Cotton ties, per bundle of 45 lb.....$1.60

Cold-Finished Steels

Bars and shafting, base, per lb.....3.25c.
Strips, base, per lb.....5.25c.

Wire Products

Nails, base, per keg.....$3.00
Galvanized nails, 1 in. and over.....$2.25 over base
Galvanized nails, less than 1 in..... 2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb..... 2.75
Annealed fence wire, base, per 100 lb..... 2.90
Spring wire, base, per 100 lb..... 3.70
Galvanized wire, No. 9, base, per 100 lb..... 3.35
Galvanized barbed, base, per 100 lb..... 3.80
Galvanized staples, base, per keg..... 3.80
Painted barbed wire, base, per 100 lb..... 3.45
Polished staples, base, per keg..... 3.45
Cement coated nails, base, per count keg..... 2.70
Woven fence, carloads (to jobbers).....67½ per cent off list
Woven fence, carloads (to retailers).....65 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads.....50 per cent off list
Machine bolts, small, cut threads....40 and 10 per cent off list
Machine bolts, larger and longer....40 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
  Smaller and shorter, rolled threads.....45 per cent off list
  Cut threads .....40 per cent off list
  Longer and larger sizes.....40 per cent off list
Lag bolts .....50 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....40 and 10 per cent off list
  Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
  Smaller and shorter .....35 and 5 per cent off list
  Larger and longer sizes.....35 and 5 per cent off list
Hot pressed square or hex. nuts, blank.....$3.00 off list
Hot pressed nuts, tapped ..... 2.75 off list
C.p.c. and t. square or hex. nuts, blank..... 3.00 off list
C.p.c. and t. square or hex. nuts, tapped..... 2.75 off list
Semi-finished hex. nuts:
  ⅞ in. and smaller, U. S. S.....75 and 5 per cent off list
  ⅝ in. and larger, U. S. S.....70 and 2½ per cent off list
  Small sizes, S. A. E.....75, 10 and 5 per cent off list
  S. A. E., ⅝ in. and larger.....75, 10 and 2½ per cent off list
Stove bolts in packages.....75, 10 and 5 per cent off list
Stove bolts in bulk.....75, 10, 5 and 2½ per cent off list
Tire bolts .....50, 10 and 10 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws,
  70 and 10 per cent off list
Milled set screws.....70 and 10 per cent off list
Upset cap screws.....75 per cent off list
Upset set screws .....75 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$3.25
Large boiler rivets, base, per 100 lb..... 3.35
Small rivets .....60 and 10 to 60 and 5 off list

Track Equipment

Spikes, ⅜ in. and larger, base, per 100 lb..... $3.15
Spikes, ½-in., ⅝ in. and ¾ in., per 100 lb..... 3.75
Spikes, ⅞ in..... 3.75
Spikes, boat and barge, base, per 100 lb.....$3.50 to 3.75
Track bolts, ¾ in. and larger, base, per 100 lb.. 4.25
Track bolts, ½ in. and ⅝ in., base, per 100 lb.. 5.50
Tie plates, per 100 lb..... 2.60 to 2.75
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜.....	+11	+39
¼ to ⅜.....	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½.....	30	13
1 to 3.....	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6.....	59	47½	2½	26	11
7 and 8.....	56	43½	3 to 6.....	28	13
9 and 10.....	54	41½	7 to 12.....	26	11
11 and 12....	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3.....	61	50½
¼ to ⅜.....	47	30½	¼ to ⅜.....+19		+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½.....	60	49½	1 to 1½.....	30	14

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4.....	57	46½	2½ to 4.....	29	15
4½ to 6.....	56	45½	4½ to 6.....	28	14
7 to 8.....	52	39½	7 to 8.....	21	7
9 and 10....	45	32½	9 to 12.....	16	2
11 and 12....	44	31¼			

To the large jobbing trade the above discounts are increased by one point, with supplementary discount of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent, on galvanized.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.....	27	1½ in.....+18	
2½ to 2¾ in.....	37	1⅝ to 1⅞ in.....+ 8	
3 in	40	2 to 2¼ in.....— 2	
3¼ to 3¾ in.....	42½	2½ to 3 in.....— 7	
4 to 13 in.....	46	3¼ to 4½ in.....— 9	

Less carload lots 4 points less.

Standard Commercial Seamless Boiler Tubes
Cold Drawn

1 in.	55	3 and 3¼ in.....	36
1¼ and 1½ in.....	47	3½ and 3¾ in.....	37
1¾ in.	31	4 in.	41
2 and 2¼ in.....	22	4½ in . and 5 in.....	33
2½ and 2¾ in.....	32		

Hot Rolled

3 and 3¼ in.....	38	4 in.	43
3½ in. and 3¾ in....	39		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of net larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....83 per cent off list
Carbon 0.30 to 0.40, base.....81 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage.....	15	2¼-in. O.D. 10 gage...	20
2-in. O.D. 11 gage.....	16	3-in. O.D. 7 gage.....	35
2-in. O.D. 10 gage.....	17	1½-in. O.D. 9 gage....	15
2¼-in. O.D. 12 gage...	17	5¾-in. O.D. 9 gage....	55
2¼-in. O.D. 11 gage...	18	5½-in. O.D. 9 gage....	57

Tin Plate

Standard cokes, per base box.....$5.50 to $5.75

Terne Plate

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb base $11.00		20-lb. coating I. C....$14.90	
8-lb. coating I. C....	11.30	25-lb. coating I. C....	16.20
12-lb. coating I. C....	12.70	30-lb. coating I. C....	17.35
15-lb. coating I. C....	13.95	35-lb. coating I. C....	18.35
		40-lb. coating I. C....	19.35

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....3.00c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.85c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb.....5.35c.

Galvanized

No. 28 (base), per lb.....5.00c.

Long Ternes

No. 28 gage (base), 8-lb. coating, per lb.....5.30c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.85c.

Manufactures have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.32	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export...	0.235	Cleveland	0.215	Kansas City	0.735
Baltimore, domestic...	0.31	Cleveland, Youngstown		Kansas City (pipe)...	0.705
Baltimore, export.....	0.225	Comb.	0.19	St. Paul	0.60
New York, domestic...	0.34	Detroit	0.29	Omaha	0.735
New York, export.....	0.255	Cincinnati	0.29	Omaha (pipe).....	0.705
Boston, domestic.....	0.365	Indianapolis	0.31	Denver	1.27
Boston, export.....	0.255	Chicago	0.34	Denver (pipe)	1.215
				Pacific Coast	$1.34
				Pac. Coast, ship plates	1.20
				Birmingham	0.69
				Memphis	0.385
				Jacksonville, all rail..	0.50
				Jacksonville, rail and water	0.415
				New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products including cut or wire nails, spikes, and wire hoops, 30c. to 40c.; sheets and tin plates, 30c. to 40c.; rods, wire rope cable and strands, 75c.; wire fencing, netting and stretcher, 49c.; pipes not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Old range non-Bessemer, 51½ per cent iron	5.70
Messabi Bessemer, 55 per cent iron	6.20
Messabi non-Bessemer, 51½ per cent iron	5.55

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	11½c.
Iron ore, Swedish, average 66 per cent iron	11c. to 11.25c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal	48c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	42c.
Manganese ore, Brazilian or Indian, nominal	45c.
Tungsten ore, per unit, in 60 per cent concentrates	$8.50
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f. Atlantic seaboard	18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$120.00 to $125.00
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid	125.00 to 130.00
Spiegeleisen, domestic, 19 to 21 per cent, per ton, furnace	45.00 to 47.50
Spiegeleisen, domestic, 16 to 19 per cent, furnace, per ton	44.00 to 46.50
Ferrosilicon, 50 per cent, delivered per gross ton	90.00 to 92.50
Ferrosilicon, Bessemer, 10 per cent, per ton, furnace	48.50
Ferrosilicon, Bessemer, 11 per cent, per ton, furnace	51.80
Ferrosilicon, Bessemer, 12 per cent, per ton, furnace	55.10
Ferrosilicon, Bessemer, 13 per cent, per ton, furnace	59.10
Ferrosilicon, Bessemer, 14 per cent, per ton, furnace	64.10
Silvery iron, 6 per cent, per ton, furnace	37.00
Silvery iron, 7 per cent, per ton, furnace	38.00
Silvery iron, 8 per cent, per ton, furnace	39.50
Silvery iron, 9 per cent, per ton, furnace	41.50
Silvery iron, 10 per cent, per ton, furnace	43.50
Silvery iron, 11 per cent, per ton, furnace	46.80
Silvery iron, 12 per cent, per ton, furnace	50.10
Ferrotungsten, per lb. contained metal	88c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	12c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.	11.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica per net ton f.o.b. Illinois and Kentucky mines	$22.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica per net ton, f.o.b. Illinois and Kentucky mines	23.50

Per 1000 f.o.b. works:

	High Duty	Moderate Duty
Fire Clay:		
Pennsylvania	$48.00 to $51.00	$43.00 to $46.00
Ohio	45.00 to 47.00	40.00 to 43.00
Kentucky	45.00 to 47.00	42.00 to 45.00
Illinois	48.00 to 50.00	45.00 to 47.00
Missouri	48.00 to 50.00	38.00 to 43.00
Ground fire clay, per net ton		6.50 to 9.50
Silica Brick:		
Pennsylvania		47.00
Chicago		52.00
Birmingham		48.00
Ground silica clay, per net ton		10.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		50.00

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$42.50 to $43.00
Rolling billets, 2-in. and under	44.00 to 45.00
Forging billets, ordinary carbons	52.50 to 55.00
Sheet bars, Bessemer	45.00
Sheet bars, open-hearth	45.00
Slabs	42.50 to 43.00
Wire rods, common soft, base, No. 5 to ⅜-in.	51.00
Wire rods, common soft, coarser than ¾-in.	$2.50 over base
Wire rods, screw stock	$5 per ton over base
Wire rods, carbon 0.20 to 0.40	$3 per ton over base
Wire rods, carbon 0.41 to 0.55	$5 per ton over base
Wire rods, carbon 0.56 to 0.75	$7.50 per ton over base
Wire rods, carbon over 0.75	$10 per ton over base
Wire rods, acid	$15 per ton over base
Skelp, grooved, per lb.	2.45
Skelp, sheared, per lb.	2.45
Skelp, universal, per lb.	2.45

Finished Iron and Steel, f.o.b. Mill

Rails, heavy, per gross ton	$43.00
Rails, light, new steel, base, per lb.	2.25c.
Rails, light, rerolled, base, per lb.	2.15c. to 2.20c.
Spikes, ⅝-in. and larger, base, per 100 lb.	$3.15 to $3.25
Spikes, ½-in., 7/16-in. and ⅜-in., base, per 100 lb.	3.25 to 3.75
Spikes, 5/16-in., base, per 100 lb.	3.25 to 3.75
Spikes, boat and barge, base, per 100 lb.	3.50 to 3.75
Track bolts, ⅝-in. and smaller, base, per 100 lb.	4.25 to 5.50
Track bolts, ¾-in. and larger, base, per 100 lb.	4.25 to 4.50
Tie plates, per 100 lb.	2.55 to 2.60
Angle bars, per 100 lb.	2.75
Bars, common iron, base, per lb.	2.50c. to 2.60c.
Bars, rail, steel reinforcing, base, per lb.	2.15c. to 2.25c.
Ground shafting, base, per lb.	3.65c.
Cut nails, base, per keg	$3.40

Alloy Steel

S.A.E. Series Numbers	Bars 100 lb.
2100 (½% Nickel, 10 to 20 per cent Carbon)	$3.75
2300 (3½% Nickel)	$5.50 to 5.75
2500 (5% Nickel)	8.25
3100 (Nickel Chromium)	4.75
3200 (Nickel Chromium)	6.50
3300 (Nickel Chromium)	8.50
3400 (Nickel Chromium)	7.50
5100 (Chromium Steel)	4.25
5200 (Chromium Steel)	8.50
6100 (Chromium Vanadium bars)	5.25 to 5.50
6100 (Chromium Vanadium spring steel)	5.00 to 5.25
9250 (Silico Manganese spring steel)	4.25
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	5.75
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	5.00
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	4.75
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb. f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are $10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets down to and including 2½-in. sq. there is a size extra of $10 per gross ton: on billets smaller than 2½-in. sq. the net ton bar price applies.

Gage Steel Committee Progress Report

The fifth progress report of the gage steel investigation has been made in communication No. 9 of the gage steel committee of the Bureau of Standards. A section dealing with dimensional changes with heat treatment includes discussion of the effect of quenching temperature, quenching medium, time at quenching temperature and tempering on the length and diameter changes of four tool steels.

Some results of the application of mathematical analysis to water and oil quenching are given in a section on temperature distribution in cooling steel cylinders, and expedients for removing abraded material from the test specimens are reviewed in a paragraph on wear tests. A section on "Resumé of Experiments on Die Steels," prepared by H. J. French, gives the results of extended tests, inaugurated prior to the formation of the gage steel committee, on the dimensional changes of eight steels.

The Seven Pines ordnance depot which was erected during the war at an estimated cost of $2,000,000 and includes about 1268 acres of land and 1100 buildings, was sold at auction by the Government, June 12, to the Virginia Iron & Metal Co., for $115,000. The plant was originally erected by the duPont company and later turned over to the Government.

FABRICATED STEEL BUSINESS

Awards the Largest in Four Weeks with Pipe Lines and Oil Projects the Largest—New Work Light

The largest awards in several weeks were made last week, the total being close to 43,500 tons. About 24,700 tons of this is for the Hetch-Hetchy aqueduct and power plant, about 8000 tons is for tanks for oil companies in Texas and 3100 tons is for a power station at East St. Louis. The week's awards exceed the total for the past four weeks combined. New propositions call for 10,060 tons, the largest of which is 4500 tons for the New York-New Jersey vehicular tunnel. The chief items of the week are the following:

Fabricated Projects Awarded

Standard Oil Co. of Ohio, cooper shop at Cleveland, 225 tons, to McClintic-Marshall Co.

Baltimore & Ohio, bridges, 240 tons, to Fort Pitt Bridge Works.

Transit Commission of New York, highway bridge in Brooklyn, 160 tons, to Phoenix Bridge Co.

Union Electric Light & Power Co., power station at East St. Louis, Ill., 3100 tons, to Fort Pitt Bridge Works.

Office building at Jamaica, N. Y., 300 tons, to Hay Foundry & Iron Works.

Office building on East Fifty-seventh Street, New York, 150 tons, to Hay Foundry & Iron Works.

New York Edison Co., sub-station, Park Place, New York, 500 tons, to Hay Foundry & Iron Works.

Apartment house in Flatbush section, Brooklyn, 200 tons, to Hay Foundry & Iron Works.

Bay Crossing Pipe Line, Hetch-Hetchy Aqueduct, Cal., 16,700 tons, to M. W. Kellogg Co.

Steel penstocks for Moccasin Creek power plant, Hetch-Hetchy project, 8000 tons, to Western Pipe & Steel Co.

Magnolia Petroleum Co., 25 5000 bbl. tanks for Texas, 5000 tons, to United Iron Works.

Humble Oil Co., 10 80,000 bbl. tanks for Texas, 3000 tons, to Chicago Bridge & Iron Works.

Highway bridges in Sacramento County, Cal., 636 tons, to Moore Shipbuilding Co.

Otis Elevator Co., plant, Quincy, Ill., 503 tons, to Kenwood Bridge Co.

Interurban passenger station, Kansas City, Mo., 160 tons, to unnamed fabricator.

Wabash Railway, Bridge No. 116, near Gilmore, Mo., 235 tons, to American Bridge Co.

Highway bridge, La Grande, Ore., 148 tons, to Illinois Steel Bridge Co.

Racquet Club Building, Chicago, 400 tons, to Union Foundry Works.

Loew's Theater, St. Louis, 1000 tons, to Mississippi Valley Steel Co.

National Car & Foundry Co., East St. Louis, Ill., train runway, 300 tons, to Mississippi Valley Steel Co.

Federal Reserve Bank Building, St. Louis, 700 tons, to Laclede Steel Co.

Loew's Theater, St. Louis, 275 tons, to Laclede Steel Co.

Missouri Theater Apartment Building, St. Louis, 500 tons, to Laclede Steel Co.

Hunt-Spiller Corporation, Boston, foundry addition, 450 tons, to Levering & Garrigues Co.

Edison Electric Illuminating Co., Boston, power plant extension, 700 tons, Levering & Garrigues Co.

The Chester Twelfth Building, Cleveland, 200 tons, to the Cleveland Structural Steel Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

New York-New Jersey vehicular tunnel, 4500 tons of plate girder construction for approach on New York side; inquiry for same tonnage for similar work on New Jersey side will probably be sent out soon.

Public School for Deaf, No. 47, New York, 1000 tons.

United States Metal Refining Co., Carteret, N. J., scrap metal plant, 200 tons.

Office building at Seventh Avenue and Fifty-second Street, New York, 800 tons.

Loft building at 107 West Thirty-eighth Street, New York, 500 tons.

Loft building at Third Avenue and Eighty-fifth Street, New York, 200 tons.

Garage in Brooklyn, 200 tons.

Public School No. 71, New York, 400 tons.

New York World, building for presses, New York, 500 tons.

New York Edison Co., office building on 177th Street, New York, 300 tons.

Public Service of New Jersey, extension to Newark office building, 460 tons.

Hotel at Sixth Avenue and Fifty-eighth Street, New York, 1000 tons.

St. Louis-San Francisco Railroad Shops, Lindenwood, Mo., 325 tons, bids taken.

Chicago, Milwaukee & St. Paul, bridge work, 190 tons, bids taken.

Federal Reserve Bank building, vault framing, St. Louis, 100 tons, bids being taken by West Lake Construction Co.

St. Paul Gas & Light Co., power plant, St. Paul, Minn., 500 tons.

Cook County, Ill., Burnham Bridge, 500 tons.

Elks' Club, Joilet, 350 tons.

Fourteenth Street Viaduct, St. Louis, 1000 tons.

Memorial Temple, Kansas City, 700 tons.

Nurses' Training School, Barnes Hospital, St. Louis, 600 tons.

Champion Coated Paper Co., Hamilton, Ohio, 600 tons, bids taken.

Scottish Rite Cathedral, Nashville, Tenn., 700 tons, bids close June 14.

Keith Theater Building, Akron, Ohio, 500 tons; revised bids taken.

Miner Bank Building, Wilkes-Barre, Pa., bids taken.

RAILROAD EQUIPMENT BUYING

Few Cars Ordered and Inquiries Light — New Business in Locomotives at a Low Ebb

Both orders and inquiries for cars and locomotives in the past week have been light. The principal item in new orders for cars totaling 1266, was 1000 box cars for the Ford Motor Co. The principal item among the inquiries for 568 cars was about 500 for the South African Railways. There were no new inquiries for locomotives and only 48 engines ordered.

The Grand Trunk has placed an order with the American Locomotive Co. for 20 locomotives.

The Central Railroad of Vermont has ordered 24 locomotives from the American Locomotive Co.

The Western Maryland will repair 2000 steel hopper coal cars in its own shops at Baltimore.

The West India Sugar Finance Corporation has ordered 160 cane cars of 30-ton capacity from the Magor Car Corporation.

The South African Railways are in the market for 100 to 500 steel grain cars of 40-ton capacity.

The Phelps Dodge Corporation has ordered 66 concentrate cars from the Mt. Vernon Car Mfg. Co.

The Ford Motor Co. has ordered 1000 box cars from the Standard Tank Car Co.

The Louisville Railway Co. has placed 40 cars with the Kuhlman Car Co., Cleveland, 10 to be equipped with motors and 30 with trailers.

The Tennessee Central has ordered 4 locomotives from the American Locomotive Co.

The Chicago, Burlington & Quincy has placed repairs on 600 coal cars with the Pullman Co., but has withdrawn its inquiry for 200 ballast cars.

The Chicago & Eastern Illinois has ordered 2 dining cars from the Pullman Co.

The Shell Oil Co. is inquiring for 150 tank cars.

The Sinclair Refining Co. is in the market for 18 coke cars.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
June	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
6.....	15.25	14.75	41.90	7.30	7.05	6.70	6.35
7.....	15.25	14.75	42.37½	7.25	7.00	6.65	6.30
8.....	15.25	14.75	42.12½	7.25	7.00	6.60	6.25
9.....	15.25	14.75	....	7.25	7.00	6.60	6.25
11.....	15.25	14.75	42.00	7.25	7.00	6.55	6.20
12.....	15.25	14.75	42.00	7.25	7.00	6.50	6.15

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, June 12.

Some of the markets are steady to firm, while some are weaker. Copper has maintained a uniform level some days, with the tendency now upward. The tin market has been spasmodic, with prices fairly steady. Lead is quiet and only slightly lower. The zinc market has declined considerably.

Copper.—For over a week now electrolytic copper has maintained a firm minimum price of 15c., delivered, and the market may now be called firm to stronger. While for early delivery there are still a few sellers at 15c. the leading producers are asking 15.12½c., delivered, but sales have been made at both levels. There is a decidedly more optimistic tone pervading the market and some believe that the lowest prices have been recorded for some time. Preliminary estimates of copper statistics for May show that shipments exceeded production, with shipments in May at about 185,000,000 to 190,000,000 lb. Another factor in the market is the strong expectation that the Ruhr problem will be settled in the near future, which will lead to heavier buying of copper by foreign consumers. This demand has fallen off recently, but is at present a little more active. Domestic buying is only fair, but consumers are watching the situation very closely. Lake copper is steady at 15.25c. to 15.37½c.

Tin.—On June 6 and 7 the Straits tin market was quite active, sales totaling about 900 tons for those days. For the calendar week ended last Saturday the sales were about 1200 tons. Most of this buying was by dealers, although consumers purchased moderate amounts, but they were not much of a factor. Yesterday 350 to 400 tons changed hands, dealers doing most of the buying and the metal being mostly future delivery. Spot delivery went at 42c. and futures at 41.62½c. to 41.87½c. per lb., and at £202 per ton. London prices today are only about 15s. per ton below those of a week ago at £197 for spot standard, £197 7s. 6d. for future standard, and £200 for spot Straits. At New York spot Straits tin was quoted today at 42c. Arrivals thus far this month have been 1610 tons, with 6700 tons reported afloat.

Lead.—The lead market is a quiet one, with prices slightly lower but steady. In other words, the premium in the outside market has disappeared. New business is not conspicuous but specifications on contract are still heavy. The leading interest continues to quote 7.25c., New York, and this is also the price in the outside market, with 7c., St. Louis, the other quotation.

Zinc.—A moderate reaction has taken place in this market this week, and prices are about 25 points lower. For some time there has been pressure to sell the June position which, together with very light demand, are the principal causes. Prime Western for delivery into August is quoted as low as 6.15c., St. Louis, or 6.50c., New York, with demand light. A feature of the market is the disappearance of premiums on prompt and early shipment so that there is very little spread between June and August-September shipment. The fact that the market has been declining is also taken as an indication that the May statistics will show a substantial increase in stocks.

Nickel.—Shot and ingot metal are quoted unchanged at 29c. to 32c. per lb., with electrolytic nickel held at 32c. by the leading producers. In the outside spot market quotations for shot and ingot nickel are 29c. to 32c. per lb.

Antimony.—In the absence of buying the market has declined so that wholesale lots of Chinese metal for early delivery are quoted at 6.75c. per lb., New York, duty paid.

Aluminum.—Wholesale lots of virgin metal, 98 to 99 per cent pure, are quoted for early delivery by such importers as can deliver the metal at 26.50c. to 27c. per lb., New York, duty paid. No quotations are available from the leading domestic producer.

Old Metals.—Business is quiet but the market is firm. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	14.75
Copper, heavy and wire	13.75
Copper, light and bottoms	11.50
Heavy machine composition	11.50
Brass, heavy	8.75
Brass, light	7.00
No. 1 red brass or composition turnings	9.75
No. 1 yellow red brass turnings	7.75
Lead, heavy	6.50
Lead, tea	5.50
Zinc	5.00

Chicago

June 12.—In a quiet and uncertain market tin and lead have made slight gains, while zinc has declined. Antimony has been weakened by heavy imports. Among the old metals the copper and tin grades have declined. We quote, in carload lots, lake copper, 16c.; tin, 43.50c.; lead, 7.10c.; spelter, 6.30c.; antimony, 8.50c. in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 12c.; copper bottoms, 10c.; red brass, 8.50c.; yellow brass, 6.50c.; lead pipe, 5c.; zinc, 4c.; pewter, No. 1, 25c.; tin foil, 27.50c.; block tin, 32.50c.; all buying prices for less than carload lots.

Truscon-I Construction

Three pamphlets, 8½ x 11 in., have been issued by the Truscon Steel Co., Youngstown, Ohio, describing and illustrating a new form of building construction said to result in a saving in steel costs, retaining the economy of steel inherent to reinforced concrete, but eliminating the expense and inconvenience of form work. The new construction has the self-sustaining qualities of structural steel, but eliminates its heavy steel tonnage.

Essentially, the upper flange of an I-beam is slit in sections along both edges and the prongs thus created turn up to a height of nearly the depth of the beam. Removable steel forms are supported by the I-beams and require in addition one row of upright supports in the middle of the bay, in place of the large amount of uprights in ordinary concrete work. Concrete is then poured over the forms and works itself around the I-beams, the prongs of which form an effective tie between the steel beam and the mass of the concrete. As the whole thing is worked out on a standardized basis, both speed and economy are served.

In the three pamphlets are found descriptions of the method, with numerous sectional illustrations showing alternative forms of detailed construction, illustrations of buildings in process of construction by this method and a series of tests covered in the 32-page pamphlet, these tests having been conducted by the Massachusetts Institute of Technology, the University of Nebraska and Purdue University, as well as in the laboratories of the Truscon company. Details are given of deformation and deflection for all of these tests, and discussion of the results.

A puddling wage well above $13 per ton is predicted for the next bi-monthly settlement. Advance in the base rate from $6 to $7 per ton will of itself furnish part of the increase. It is also expected an increase of 50c. per ton or more in muck bar prices will boost the rate.

PERSONAL

George F. Murphy has been put in charge of the New York territory of the Heine Boiler Co., St. Louis. One of his assistants will be G. A. Knowles.

Robert T. Pearce, for many years manager of the eastern sales and engineering office of H. W. Caldwell & Son Co., is now manager of the Webster Manufacturing Co., New York.

Joseph G. Worker, secretary of the Stoker Manufacturers' Association of the United States, has joined the organization of the American Engineering Co., Philadelphia.

Fred H. Dorner, Milwaukee, has been appointed Wisconsin representative for the Standard Turbine Corporation, Wellsville, N. Y.

N. F. Harriman, engineer and physicist connected with the National Bureau of Standards, has been made vice-chairman of the Federal Specifications Board, United States Bureau of the Budget.

Herman Voges, Jr., has acquired an interest in the Imperial Drop Forge Co., Indianapolis, and become secretary and general manager.

John Summersey has been appointed St. Paul sales manager of the Worthington Pump & Machinery Corporation.

Etienne Planche has resigned the position of chief engineer for the Dort Motor Car Co. to establish himself as a consulting engineer in Detroit.

Frank O. Hoagland, for several years general manager Reed-Prentice Co., Worcester, Mass., has resigned to accept a position with the mechanical department Saco-Lowell Shops, Boston.

Frederick W. McIntyre, general sales manager Reed-Prentice Co., Worcester, Mass., has been made assistant to the president, J. Verner Critchley. William T. Cowell, formerly assistant works manager Lodge & Shipley Machine Tool Co., Cincinnati, has been made works manager of the Worcester company.

Carroll R. Harding has been appointed consulting engineer of the Southern Pacific Co., 165 Broadway, New York, succeeding John D. Isaacs, who has retired on a pension. Mr. Harding is president of the Cornell Society of Engineers.

William E. Mitchel has resigned as purchasing agent of the Osborn Mfg. Co., Cleveland, to become associated with the Specialty Mfg. Co., Cleveland, maker of wire brushes and automatic brush making machinery, having purchased an interest in the company, of which he will be general manager. Earl W. Cannell has succeeded him as purchasing agent of the Osborn company. Mr. Cannell was formerly in charge of the company's sales development department.

Anton J. Berger has been placed in charge of the portable equipment sales of the Paasche Air Brush Co., 1909-1923 Diversey Parkway, Chicago. Mr. Berger has been identified with the iron and steel business for 25 years.

Henry Donovan, until recently connected with the Union Pacific System, has been appointed general manager in charge of all the manufacturing departments of the General American Tank Car Corporation, Chicago, effective July 1.

W. H. Townsend, formerly factory manager of the Automobile Screw Products Co., Cleveland, and prior to that time connected with the Atlas Bolt & Screw Co., also of Cleveland, has become affiliated with the Cleveland Duplex Machinery Co., Inc., 1224 West Sixth Street, Cleveland, as sales engineer, specializing in semi-automatic and automatic machinery.

Walter Pfeil, head of the roll shop department, Hubbard Steel Foundry Co., East Chicago, Ind., has resigned to become manager of the Standard Engineering Co. plant, Ellwood, Pa.

The Link Belt Co., Chicago, has appointed L. M. Dalton manager of its branch house at Boston to succeed E. J. Burnell, who has resigned to enter business for himself.

William H. Forbes has resigned as Cleveland district sales manager of the United Alloy Steel Corporation, Canton, Ohio. He has not yet made an announcement as to future plans.

Henry K. Spencer has been appointed manager of the Blanchard Machine Co., Cambridge, Mass. His connection with the company dates from the beginning of its surface grinder business. Prior to the death of the late Winslow Blanchard, Mr. Spencer was assistant manager and chief engineer.

Wm. J. Wooldridge, manager of the electrical sheet department Whitaker-Glessner Co. and more recently holding the same position with the Wheeling Steel Corporation, has resigned. Mr. Wooldridge has not yet announced his future plans.

C. F. Rogers, formerly representing C. E. Johansson, Inc., in the Eastern territory, has been appointed factory representative for the W. B. Knight Machinery Co., St. Louis.

Herbert S. Reynolds, president People's National Bank, Jackson, Mich., and John H. Merrell, vice-president Manhattan Rubber Mfg. Co., Chicago, have been elected to the board of directors of the Reynolds Spring Co., Jackson, Mich., to fill vacancies.

Gordon C. King, formerly general manager of the Crescent Pump Co., Detroit, has been appointed purchasing agent of the Michigan Steel Corporation, Detroit.

Edward A. Niven, manager merchant sales department at New York for the American Steel & Wire Co., has been appointed Pittsburgh sales agent. W. L. Hirsch, who has represented the company at Pittsburgh for many years, will remain there in an advisory capacity. Mr. Niven has been with the American Steel & Wire Co. and its predecessors for 30 years and before entering the sales department had much mill experience. He is a native of Pittsburgh.

A. F. Strafer, formerly general manager Graves Machinery Exchange, Jersey City, N. J., is now sales manager of the Industrial Plants Corporation, 25 Church Street, New York.

Basing Point Hearing Continued at Pittsburgh

PITTSBURGH, June 12.—John Follansbee, vice-president and general sales manager, Follansbee Bros. Co., Pittsburgh, testifying at Tuesday's session of the basing point hearing, said that his company not only was a producer of sheets but also a buyer of sheets and tin plate and that at the present time his company had four tin plate contracts and two sheet contracts, all at different prices. Other witnesses examined Tuesday were Frank Moeschel, vice-president Newport Rolling Mill Co., Newport, Ky.; Samuel E. Eldridge, assistant to vice-president American Rolling Mill Co., Middletown, Ohio; and A. J. Krantz, treasurer Reeves Mfg. Co., Dover, Ohio.

Electric Hoist Sales

The members of the Electric Hoist Manufacturers Association report an increase as compared with the previous month in the number of hoists ordered during May amounting to 11.3 per cent and an increase of 13.004 per cent in the value of hoists ordered. Shipments of hoists decreased 8.606 per cent as compared with the previous month.

C. H. Booth, a director of the Youngstown Sheet & Tube Co., has been elected president of the Republic Rubber Co., a subsidiary of the Lee Rubber & Tire Co., Philadelphia, which purchased at receiver's sale the assets of the Republic Rubber Corporation, operating plants at Canton and Youngstown. The company will continue to manufacture Republic products, emphasizing especially mechanical rubber goods. Mr. Booth had been receiver for the old Republic company for the past two years.

OBITUARY

CLYDE MITCHELL CARR, until recently president, Joseph T. Ryerson & Son, Chicago, died June 5 at his home in that city, following several weeks' illness.

CLYDE MITCHELL CARR

Mr. Carr was born in Will County, Ill., July 7, 1869. He was educated at Princeton and Northwestern universities, and after leaving college was connected with the Peoples Gas Light & Coke Co., Chicago, for a time, later becoming a salesman for W. S. Mallory & Co., iron jobbers. His connection with the Ryerson company dated from 1890. He was elected president in 1911 and resigned in February of the current year because of ill health, continuing, however, as a director. Mr. Carr was also director of the Chicago Great Western Railroad and the Corn Exchange National Bank, Chicago, and trustee of the Art Institute of Chicago and the Orchestral Association, Chicago. He was a member of the American Iron and Steel Institute and of various social clubs.

CHARLES W. DAMBACHER, formerly for 13 years superintendent North Side Foundry, H. B. Smith Co., Westfield, Mass., manufacturer of heating appliances, died at his home in that city, June 5. Mr. Dambacher was born in Canaan, Conn., 70 years ago.

LEVI RAWSON GREENE, Cambridge, Mass., engineer, died at his home in that city June 4, in his ninety-first year. Mr. Greene served his mechanical engineering apprenticeship with the Corliss Steam Engine Co., later entering the United States Navy, and subsequently became consulting engineer with the Walworth Mfg. Co., Boston, which position he held at the time of his death.

OSCAR RICHEY, a pioneer in the iron trade at Ironton, Ohio, died May 29 at the age of 76. Until he retired recently from active business, Mr. Richey was president and general manager of the Kelly Nail & Iron Co., which owned and operated the Sarah blast furnace and the Kelly nail plant. He was also interested in other local business, including a bank and two lumber companies. Following his return early in April from Florida, where he went to restore his health, Mr. Richey failed rapidly and the end was foreseen. Mr. Richey began his career with the Kelly Nail & Iron Co. in 1882 as a clerk, becoming secretary and treasurer of the company a few years later. About 1900, Mr. Richey was elected president and general manager, retaining the office until he retired a few years ago on account of ill health.

HENRY M. SPENCER, president of the Howell Electric Motor Co., and the Spencer-Smith Machine Co., Howell, Mich., died at his home in that city June 4. Mr. Spencer was 34 years of age.

HENRY SOUTHWORTH SHAW, Milton Mass., died at his home June 1, at the age of 90 years. Among the many offices held during his long life, he was president Saco & Pettee Machine Shop, Saco-Lowell Machine Shops, Eastern Machinery Co. and Rhode Island Malleable Iron Works. He was at one time president of the Boston & Maine Railroad and treasurer of the old Cape Cod Railroad.

WILLARD T. SEARS, research and experimental engineer of the Niles-Bement-Pond Co., 111 Broadway, New York, who died recently at Montclair, N. J., had been employed by the company for more than 20 years. For a number of years Mr. Sears was connected with the Pennsylvania Steel Co. He was a member of the class of 1887 of the Massachusetts Institute of Technology. Mr. Sears was an inventor, and the machine tool industry has been benefited by many of the developments which he originated.

ERNEST G. ELDRIDGE, for years engaged in the sale of machine tools, died at his home in Blue Island, Ill., April 21, after a long illness. Mr. Eldrige was born in 1880 at Galva, Ill., and entered the machine tool business as a salesman with McDowell-Stocker Co., Chicago, and later was identified with the E. L. Essley Machinery Co. of the same city. In 1912 he organized the E. G. Eldridge Machinery Co., with a store at 29-31 North Jefferson Street, Chicago. He conducted this business for three or four years and then sold out to the E. L. Essley Machinery Co. Subsequently he moved to Los Angeles, Cal., and was identified with the Eccles & Smith Co. as a salesman. Because of failing health, he resigned that position and returned to Blue Island three years ago.

CECIL WILLIAM LEIGH, chief engineer of the 1-4 E. blast furnace department, South Works, Illinois Steel Co., Chicago, died May 16, at his home in that city after a brief illness with pneumonia.

CHARLES E. THOMAS, for many years general manager of the Cleveland Punch & Shear Works Co., Cleveland, and for the past nine years connected with the sales department of the Hilles & Jones Co., Wilmington, Del., now one of the branches of the Consolidated Machine Tool Corporation, died June 8. Mr. Thomas was 54 years of age and leaves his wife and three daughters.

WILLIAM Z. WOODSIDE, formerly a member of the foundry firm of Shinnick, Woodside & Gibbons, Zanesville, Ohio, stove manufacturers, died recently, at the age of 92 years.

New Coast to Coast Water Freight Rates

Uniform water freight rates between ports on the Atlantic Coast and ports on the Pacific Coast via the Panama Canal on iron and steel have been announced by the United States Intercoastal Conference, 17 Battery Place, New York, an organization of ship operators, including the lines of the United States Shipping Board. The rates go into effect Aug. 1 and supplant a variety of rates which have been charged by individual ship owners.

The new rates apply to all pieces of iron and steel up to 35 ft. long. Pieces over 35 ft. long are subject to a graduated scale which has not yet been worked out. The tariffs are all for carload lots.

On bands, hoops, bars, rods, slabs and strips the rate is 40c. per 100 lb.

On corner beads, expanded metal flooring and lathing, concrete reinforcement, studding iron, 60c.

Link belting, chain castings, chain, inclusive of chain shackles, 45c.

Billets, blooms, ingots, muck bars, 40c.

Bolts, nuts, rivets, lag screws and washers, etc., 40c.

Toe calks and horse, mule and ox shoes, 40c.

Castings (rough), clevises, forgings, ingot molds, sprocket wheels (as from molds), 50c.

Boiler ends, boiler heads, plates and sheets, gage No. 11 and heavier, 40c.

Plates and sheets, gage No. 12 or lighter, 50c.

Corrugated iron flashings, ridge rolls, 60c.

Ferromanganese, ferrosilicon and spiegeleisen, 40c.

Pig iron, 35c.

Boiler flues, wrought iron pipe, not over 12 in. diameter or 20 ft. long, 45c. Wrought iron pipe, not over 12 in. diameter, over 20 ft. long but not over 40 ft. long, 55c.

Nails, spikes, wire products, dowel pins, hoop fasteners, sheet fasteners for roofing, stay guards, wire hoops, fence posts, staples, stretchers, etc., 40c.

Pipe fittings or connections not over 12 in. diameter, 45c. Over 12 in. diameter, 55c.

Plates, gage No. 11 and heavier, shapes and bars, 40c.

Structural steel fabricated, 55c.

Rails, 40c. Rail fastenings, 40c.

Tin plate in boxes strapped, 40c.

Machinery Markets and News of the Works

MORE RAILROAD ACTIVITY

Santa Fe Closes Orders and Total Will Reach About $300,000

Westinghouse Electric & Mfg. Co. Asks for Prices on 75 Tools for East Pittsburgh Plant

Despite a falling off in general buying by industrial companies, prospects for a continuance of machine-tool activity appear bright in view of the demands of the railroads for new shop equipment. The Sante Fe road last week at Chicago started placing orders, and when its purchases have been completed this week the total will reach about $300,000. The Elgin, Joliet & Eastern, which has a large list pending, is expected to be the next to take action.

In the East, where railroad buying has not been as important in volume as that in the Central West, the week has been featured by two inquiries, one from the Central Railroad of New Jersey for 8 or 10 tools and one from the Lehigh Valley for about the same number. The Norfolk & Western, which recently inquired for a large list, has not bought but is expected to do so shortly.

The Westinghouse Electric & Mfg. Co. has put out the largest inquiry of the week in the industrial field, having asked for prices on about 75 tools for its East Pittsburgh works. The General Electric Co., Schenectady, continues to buy and has inquired for more tools.

Some of the Detroit automobile companies have made tentative inquiry for modern tools for replacements, but it is not certain whether purchases will be made within the near future.

Trade in second-hand tools is still very good and more tools are coming on the market. Last week the entire equipment of the Berling Magneto Co., Buffalo, consisting of more than 300 tools, was sold at auction, being purchased largely by machinery users, but some of the tools went to dealers.

New York

NEW YORK, June 12.

THE Central Railroad of New Jersey, which a few weeks ago bought 8 or 10 machine tools, has put out an inquiry for additional shop equipment as follows: Three turret lathes, a pneumatic horizontal bending and forming machine, a 26-in. gap double punch and shear, a 3300-lb. single-frame steam hammer, a 5-ft. radial drill, a 20-in. x 12-ft. engine lathe and an 18-in. x 8-ft. engine lathe. The Lehigh Valley Railroad has inquired for 10 or a dozen tools, but its purchasing department informs THE IRON AGE that it is not certain that the machines will be bought at this time. The General Electric Co., which has been a steady buyer of tools for some months, has put out inquiries for more tools. Otherwise machine-tool buying continues in a steady way without the volume which was attained in the early months of the year, but the totals are satisfactory to sellers. Demand for used tools is a particularly good feature of the situation.

The Board of Estimate, New York, has approved an appropriation of $4,500,000 for the construction of a central machine repair shop for Manhattan Borough on Barren Island, with municipal service department for automobiles and trucks, and reclamation department, including machinery. The Department of Plant and Structures, Grover A. Whalen, commissioner, Municipal Building, will be in charge.

H. P. O. Newstrand, Greenwich, N. Y., is organizing a company to build a paper mill on site adjoining the former Lezier paper mill, Plattsburg, N. Y., for which plans are being drawn. It will be one-story, estimated to cost $80,000 with equipment.

The Utica Hygeia Ice Corporation, 1124 Pleasant Street, Utica, N. Y., C. A. Schmidt, head, is planning the construction of a new one-story ice-manufacturing plant, estimated to cost $80,000.

The Titanium Pigment Co., 94 Fulton Street, New York, a subsidiary of the National Lead Co., and affiliated with the Titanium Alloy Mfg. Co., same address, is completing negotiations for the purchase of the plant of the Mineral Refining & Chemical Corporation, Carondelet Station, St. Louis. Extensions and improvements will be made. Evans McCarthy is president of the purchasing company.

The Railway Steel Spring Co., 30 Church Street, New York, has awarded contract to the McClintic-Marshall Co., Oliver Building, Pittsburgh, for a one-story addition to its plant at Latrobe, Pa., 175 x 1000 ft., to be equipped for the most part as a machine shop, estimated to cost $350,000.

Motors, conveying equipment and other mechanical apparatus will be installed in the five-story printing plant, 31 x 100 ft., to be erected at 13 Frankfort Street by the Press Publishing Co., 63 Park Row, New York, to cost approximately $160,000. Cross & Cross, 385 Madison Avenue, are architects.

The Seneca Copper Corporation, 120 Broadway, New York, is arranging for a bond issue of $1,500,000, of which $1,000,000 will be sold at once, a portion of the proceeds to be used for extensions and improvements.

The Stewart-Warner Speedometer Corporation, 1828 Diversey Parkway, Chicago, manufacturer of precision instruments, has acquired property, 100 x 100 ft., on West Sixty-fifth Street, New York, and will have plans prepared for the construction of an Eastern factory branch.

The Scotia Electric & Mfg. Co., Scotia, N. Y., has been formed under State laws to build and operate a local light and power plant. The company is headed by W. N. Vandeberg and A. C. Neilson. It is represented by J. H. Gould, Schenectady, N. Y.

The American Smelting & Refining Co., 120 Broadway, New York, is said to be arranging an appropriation in excess of $2,000,000 for extensions in its coal properties in the Rosita coalfield, Sabines, State of Coahuila, Mex., including the installation of electric power and other machinery, with coke ovens, etc.

The Grubman Engineering & Mfg. Co., 589 Grand Street, New York, has leased space in the building at 492 Broome Street for extensions in its plant.

The Durant Motors, Inc., 1819 Broadway, New York, will arrange production facilities for the manufacture of a complete new line of four and six-cylinder automobiles, in addition to its present motor output, to be known as the Eagle Four and Six. The plant will be in the Eastern district. W. C. Durant is president.

Fire, June 5, destroyed a portion of the power plant of Witherbee, Sherman & Co., at Cookshaft, N. Y., with loss estimated at $75,000, including equipment. It is planned to rebuild. Headquarters of the company are at 2 Rector Street, New York.

Motors, conveying equipment and other machinery will be installed in the new four-story and basement printing plant, 40 x 56 ft., to be erected by the A. V. Haight Co., 10 Liberty Street, Poughkeepsie, N. Y., for which bids will be taken at once. L. L. Booth, 20 Cannon Street, is architect.

Manual training equipment will be installed in the two-story high school addition to be erected at Red Hook, N. Y., estimated to cost $200,000, for which bids will soon be called

The Crane Market

FEW new inquiries for overhead traveling cranes have appeared in the past week and pending business is, in most instances, still being delayed. In contrast to the present quiet in overhead cranes is the activity in the locomotive crane market. The recent inquiry of the Submarine Boat Corporation, Port Newark, N. J., for 10 locomotive cranes, specifies a capacity to lift 4 tons at 90-ft. radius. Among the locomotive crane inquiries still pending is a 20-ton crane for the Chesapeake & Ohio Railway Co., Richmond, Va., two locomotive cranes for the Central Railroad of New Jersey, Jersey City, N. J., a 40-ton crane for the Union Carbide Co., 30 East Forty-second Street, New York, a 12½-ton crane for the Worthington Pump & Machinery Corporation, Harrison, N. J., five 20-ton locomotive cranes for the Baltimore & Ohio Railroad, Baltimore, Md., and an electric, crawl-tread locomotive crane for the Orange & Rockland Electric Co., Monroe, N. Y. Among the overhead crane inquiries is a request for bids on some small cranes from the Otis Elevator Co., Yonkers, N. Y.

Among recent purchasers are:

Honolulu Iron Works Co., 233 Broadway, New York, two 20-ton, 57-ft. span overhead traveling cranes, one for use at Manila, the other for Honolulu, from the Whiting Corporation.

Empire Engineering Co., Baltimore, Md., a 20-ton locomotive crane for the Browning Co.

Big Four Railroad, Cincinnati, Ohio, a 30-ton locomotive crane from the Orton & Steinbrenner Co., a 25 to 35-ton locomotive crane from the McMyler Interstate Co. and a 30-ton locomotive crane from the Ohio Locomotive Crane Co.

Landers Egbert Co., Valparaiso, Ind., a 7½-ton, 40-ft. boom used Osgood locomotive crane from Philip T. King, 30 Church Street, New York.

Alabama Limestone Co., Woodland, Ala., a 20-ton used Industrial locomotive crane and a 15-ton used Ohio locomotive crane from Philip T. King, 30 Church Street, New York.

Michigan Paper Box Co., Charlotte, Mich., a 25-ton, 50-ft. boom used Browning locomotive crane from Philip T. King, 30 Church Street, New York.

Southern Pacific Co., 120 Broadway, New York, a 25-ton, 67-ft. span overhead traveling crane for use at Bayshore, Cal., from the Niles-Bement-Pond Co.

The Chicago, Burlington & Quincy a 200-ton locomotive hoist from the Whiting Corporation.

The United Coke & Coal Company, Chicago, has opened a Minneapolis branch office, 37 Lumber Exchange Building, in charge of the company's Northwestern manager, Phil S. Nightingale, a resident of Minneapolis, formerly connected with the Reeves Coal & Dock Co., that city.

Oliver Machinery Co., Grand Rapids, Mich., has made a contract with the Canadian Fairbanks Morse Co., Ltd., to represent it exclusively throughout the Dominion for the sale of its woodworking machinery and machine tools.

Detroit Steel Corporation, Detroit, Mich., a 25-ton, 47-ft. span, 4-motor, overhead traveling crane and a 5-ton, 77-ft. span, 3-motor overhead traveling crane from the Northern Engineering Works.

on revised plans. W. J. Beardsley, 49 Market Street, Poughkeepsie, N. Y., is architect.

The Paterson Parchment Paper Co., Passaic, N. J., is disposing of a bond issue of $1,500,000, a portion of the proceeds to be used in connection with a new plant at Bristol, Pa., upon which work has been commenced, designed to cost close to $2,000,000 with machinery. The company is also operating a plant at Modena, Pa. William F. Brunner is president.

The Century Cement Products Co., Lyndhurst, N. J., recently organized, has plans for extensions for the manufacture of blocks, tile and other cement products. Additional machinery will be installed. John H. McGuire, Passaic, N. J., mayor, is president of the company. Robert D. Anderson, Belleville, N. J., is secretary.

The Freyer-Schaible Co., Perth Amboy, N. J., has been formed with a capital of $100,000 to take over and expand the automobile body manufacturing plant of the Toft & Freyer Co., 429-33 East Avenue. The new company is headed by Arthur Freyer and Henry Schaible.

The Lidgerwood Mfg. Co., 326 Frelinghuysen Avenue, Newark, N. J., manufacturer of hoisting engines and machinery, has acquired through its president, John H. Lidgerwood, 54 acres at Long Avenue and Conant Street, Hillside, near Newark. In the near future it is purposed to use a portion of the site for a new plant, and remove the present branch works at the foot of Dikeman Street, Brooklyn, to this location. Property adjoining the Frelinghuysen Avenue works, heretofore held for this purpose, will be placed on the market.

E. J. Brooks & Co., Park Avenue and North Thirteenth Street, Newark, manufacturers of metal goods, are making inquiries for a 4-slide wire-forming machine, second-hand.

The Meeker Foundry Co., 95 Clay Street, Newark, manufacturer of malleable iron castings, has filed plans for a new one-story foundry addition.

The Unique Art Mfg. Co., Newark, has purchased a four-story building at the southeast corner of Waverly and Peshine Avenues, on site 100 x 115 ft., for $150,000, and will establish a new plant for the manufacture of mechanical toys.

Electric power equipment, conveying apparatus and other machinery will be installed in the one-story addition to be erected by the National Box & Lumber Co., 345 South Street, Newark, 90 x 300 ft., estimated to cost $43,000, for which a general contract has been let to the Morgan Construction Co., 207 Market Street.

The Progressive Paper Box Co., Seventeenth Avenue and Boyd Street, Newark, has purchased property at 341-55 Jelliff Avenue as a site for a new plant, for which plans will be prepared at once. The present factory has been sold and the equipment will be removed to the new location, where additional machinery will be installed. Max Schiffenhaus is head.

New England

BOSTON, June 11.

SALES of machine tools in this territory so far this month have not been more than 50 per cent of those for the corresponding days in May, which, in turn, were about 50 per cent of those for April. Contrasted with pre-war days, however, business is just about holding its own. Although the amount involved is comparatively small, enough prospective business developed the past week to justify the belief that sales next month, a usually quiet period, will show healthy expansion. The better feeling is largely due to a slightly more active crane market and to an inquiry from a cotton goods manufacturer for a fairly large list of metal and wood-working equipment, although the number of quotations put out on one, two and three tools the past week or ten days is gratifying.

The Sullivan Machinery Co., Claremont, N. H., is about to close on two or three cranes; Stone & Webster, Boston, engineers, have inquiries out on fairly important lifting equipment, and a South Boston foundry is asking prices on cranes. The city of Boston, School Department, is accepting bids until today for furnishing and installing sheet metal-working machinery in the Lowell School, Jamaica Plain. A new construction program presumably has reduced the amount of money that will be expended this year by the Central Vermont Railroad on shop equipment. The company's original budget called for approximately $25,000 worth of equipment.

Prices are firm all down the line. The Columbia Machine Tool Co., Cincinnati, has raised prices on shapers about 10 per cent. An Everett, Mass., maker of grinding equipment has revised prices, in some cases upward and in others downward, the largest advance not exceeding 10 per cent.

Sales of small tools hold up remarkably well. They did relatively better than large tools in May. The call for transmission also is active.

New England manufacturers of mining equipment report a steady expansion in business, especially export in the Far East. Drills and compressors have the largest sale.

The Hunt-Spiller Mfg. Co., 363 Dorchester Avenue, South Boston, gun castings, etc., has had plans prepared for a 135 x 240 ft. addition to cost about $150,000. The company is inquiring for three cranes.

The Farr Alpaca Co., Holyoke, Mass., has awarded contract for alterations on a boiler house and for the erection of a power plant adjacent to the boiler house. The boiler house will be refitted with new equipment. Close to $1,000,000 is involved in the work and equipment.

Contract for one of the largest centrifugal pumps ever installed in New England has been awarded the Stark-

weather & Broadhurst, Inc., Boston, by the sewerage division, Massachusetts Metropolitan District Commission. The pump will have a capacity of 50,000,000 gal. per day, or 35,000 per min. or 150 tons per sewerage minute. It will be built at the Morris Machine Works, Baldwinsville, N. Y.

Peck, Stowe & Wilcox, Southington, Conn., have had preliminary plans prepared for a new manufacturing unit.

Contract has been awarded by the Saco-Lowell Shops, Boston, textile machinery, for the erection of a 40 x 100 ft. forge shop. Plans were prepared by Lockwood, Greene & Co., Boston, engineers.

The main unit of the Ware Foundry Co., Ware, Mass., last week was damaged by fire to the extent of about $15,000. A second unit containing office, pattern room and storeroom was saved. The foundry started operations about three years ago. Frank J. Quinn is manager.

The Scoville Mfg. Co., 99 Mill Street, Waterbury, Conn., manufacturer of brass products, etc., has plans for a one-story addition. H. Thompson, 57 North Main Street, is engineer.

The Tobrin Tool Co., Southington, Conn., recently organized, has leased a portion of the factory of Thomas Brothers, Summer Street, and will commence the installation of equipment for the manufacture of tools and other mechanical products.

The Lowell Electric Light Co., Lowell, Mass., has awarded a contract to Stone & Webster, Inc., 147 Milk Street, Boston, for a one-story addition to its power plant, to cost about $85,000. A steel coal conveyor system, 286 ft. long, will also be installed.

A machine shop and parts department will be installed in the new municipal automobile service building to be erected by the Department of Public Works, City Hall Annex, Boston, estimated to cost $150,000, for which a general contract will soon be let. Mulhall & Homers, 248 Boylston Street, are architects.

The Wolf New Process Abrasive Wheel, Inc., Hanover Street, Meriden, Conn., has awarded contract to Lewis A. Miller, Meriden, for a one-story addition.

The A. F. Robinson Boiler Works, Inc., First Street, Cambridge, Mass., is planning for the installation of a number of machine tools and other equipment. F. B. Wheeler is one of the heads of the company.

The United Electric Co., 73 West State Street, Springfield, Mass., has awarded a general contract to W. W. Davis, 97 Bellevue Avenue, for a one-story meter service and repair works, 50 x 150 ft., at Baxter and Wilbraham Streets, to cost about $60,000.

The J. W. Grady Co., Worcester, Mass., has been formed with a capital of $500,000 to take over the plant and business of James W. Grady & Co., manufacturers of bicycles and parts, recently in financial difficulties. The new company purposes to extend the works to include the manufacture of motorcycles and automobile parts. James W. Grady is president, and William P. Farrell, treasurer.

The Rice, Barton & Fales Machine & Iron Co., Taintor Street, Worcester, Mass., manufacturer of paper machinery, has awarded a contract to E. J. Cross & Co., 82 Foster Street, for a one-story foundry, 35 x 140 ft., to cost approximately $50,000.

The New Method Die Co., 100 Sudbury Street, Boston, is planning for the installation of a punch press, stock pressing machine and other equipment.

A manual training department will be installed in the new two-story high school to be erected at Gorham, N. H., estimated to cost $110,000. Wilson Potter, 22 East Seventeenth Street, New York, is architect.

The City Council, Holyoke, Mass., is perfecting plans for extensions and improvements in the municipal electric light and power plant, including the installation of additional machinery, estimated to cost $500,000.

Walter E. Delorey, Webster Street, Brookline, Mass., has awarded a contract to the Fritz Construction Co., Roxbury, Mass., for a one-story machine shop, 50 x 50 ft., to cost about $12,000, exclusive of machinery.

A manual training department will be installed in the two-story high school to be erected at Williamstown, Mass., estimated to cost $150,000, for which plans are being prepared by Peare, Quiner, Nevin & Chickering, 6 Beacon Street, Boston, architects.

C. H. Dexter & Sons, Inc., Canal Street, Windsor Locks, Conn., manufacturer of paper products, has awarded a contract to the R. G. Bent Co., 83 Ann Street, Hartford, Conn., for a new four-story building, 54 x 100 ft., to cost in excess of $75,000. Greenwood & Noerr, 847 Main Street, Hartford, are engineers.

The Edison Electric Illuminating Co., 39 Boylston Street, Boston, will commence the erection of a one-story power house on West Canton Street. Bigelow & Wadsworth, 3 Hamilton Place, are architects.

The Board of Public Works, Meriden, Conn., will install an electrically-operated centrifugal pump, with auxiliary equipment, at the Kenmere pumping station. J. A. Toner, City Hall, is engineer.

The Nicholson File Co., Charlotte Hope Street, Providence, R. I., Will commence the erection of a new two-story addition, one portion to be 50 x 177 ft. and the other 45 x 115 ft.

Following the recent fire at the plant of the Hurlbut-Rogers Machinery Co., South Sudbury, Mass., manufacturer of cutting machines, etc., destroying a portion of the works, the company has transferred operations to a plant at Nashua, N. H., and will remain permanently at this location.

A vocational department will be installed in the new three-story high school to be erected at Chelsea, Mass., estimated to cost $700,000, for which bids will be received on a general contract on June 27. A list of machine tools and other mechanical equipment to be installed will soon be arranged. S. S. Eisenberg, 46 Cornhill Street, Boston, is architect.

Philadelphia

PHILADELPHIA, June 11.

AN appropriation of $4,000,000 has been arranged by the Baldwin Locomotive Works, North Broad Street, Philadelphia, for extensions and improvements in its local plant, as well as at the Eddystone works, including the installation of additional machine tools and equipment to absorb more than $2,000,000 of the amount noted. Work on a new tank shop at the Eddystone plant is nearing completion, and new pipe and jacket shops, recently finished, have been placed in service. Other structures will be built.

The Philadelphia Badge Co., 942 Market Street, Philadelphia, has inquiries out for a lathe, 5 to 6 ft. bed, with 12 in. swing.

Ovens, power equipment, conveying machinery and other mechanical equipment will be installed in the new five-story plant to be erected at 4811 Germantown Avenue, Philadelphia, by J. S. Ivins' Sons, Inc., 619 North Broad Street, estimated to cost $600,000. An individual power plant will be constructed. W. E. S. Dyer, Land Title Building, is architect and engineer.

Manual training equipment will be installed in the three-story junior high school to be erected at Torresdale Avenue and Wakeling Street, Philadelphia, estimated to cost $1,100,000, for which foundations will soon be laid. Irwin T. Catherine, Board of Education, is architect.

The Philadelphia Paper Mfg. Co., River Road, Philadelphia, manufacturer of boxboard products, etc., has awarded contract to the Hughes-Foulkrod Co., Commonwealth Building, for an addition to cost about $75,000.

Charles Fey, 64 North Milnick Street, Philadelphia, has inquiries out for a power-driven lathe.

The Naval Supply Officer, Navy Yard, Philadelphia, will soon take bids for additional equipment for installation at the ice and refrigerating plant at the local naval home.

Frank Buchert, 508 Glenwood Street, Philadelphia, manufacturer of metal and wood patterns, has filed plans for a new pattern shop at 4734-36 North Second Street.

A one-story power house will be erected at the plant of Frank Schobie & Co., Tenth and Oxford Streets, Philadelphia, manufacturer of hats. Plans are being prepared by the William Steele & Sons Co., Sixteenth and Arch Streets, engineers.

The Philadelphia Suburban Co., West Washington Square, Philadelphia, is being organized to take over and merge the Philadelphia Suburban Gas & Electric Co., East Pennsylvania Gas & Electric Co., Berks County Electric Co., Bucks Electric Co., Towanerien Electric Co. and other smaller light and power companies in this section. Plans are under way for extensions in electric power plants and transmission systems, including the installation of considerable additional equipment. I. L. Craig, engineer for the Philadelphia Suburban Gas & Electric Co., will act in the same capacity for the new organization.

The Philadelphia Commercial Museum, Thirty-fourth Street, has received an inquiry from a company at Vera Cruz, Mexico, for transmission machinery, gas and gasoline engines, agricultural machinery and other mechanical equipment.

Fire, June 8, damaged a portion of the oil refinery of the Sun Co., Marcus Hook, Pa., with loss estimated at about $40,000. It will be rebuilt. Headquarters are in the Finance Building, Philadelphia.

The University of Pennsylvania, Philadelphia, is perfecting plans for the establishment of the Moore School of Elec-

trical Engineering, under a bequest of $1,500,000 provided for by the late Alfred F. Moore, local manufacturer of insulated wire. The interest from the fund will be used to enlarge the present department at the University and install additional equipment. The City Council has approved an ordinance permitting the institution to abandon its power plant at Thirty-fourth and Spruce Streets, and to use the property for other buildings. A new power plant will be erected on another location, estimated to cost in excess of $500,000, including equipment.

F. W. Woodcock and R. Van Horn, Philadelphia, are organizing five new electric companies to operate in different parts of the State, under the names of the Jackson Township Power Co., Armagh Township Power Co., Spruce Creek Township Power Co., Cass Township Power Co. and the Barree Township Power Co. Electric power plants and systems will be installed in the respective districts. Application for State charters will be made on June 25 and July 2. James Collins Jones, Bullitt Building, Philadelphia, is representative.

The Crescent Insulated Wire & Cable Co., North Olden Avenue, Trenton, N. J., has awarded contract to the Karno-Smith Co., Broad Street Bank Building, for a one-story addition to its plant.

J. Osborne Hunt, architect, 219 East Hanover Street, Trenton, N. J., has been commissioned to prepare plans for the new two-story unit to be erected by the Board of Directors, Trenton School of Industrial Art, West State Street. The structure will cost in excess of $75,000. Frank F. Fredericks is director.

The C. P. Weeden Motor Co., 153 Brunswick Avenue, Trenton, N. J., will install a machine shop and parts department in its new one-story service works addition, for which a general contract has been awarded to the Karno-Smith Co., Broad Street Bank Building.

The Abington Township School Board, Glenside, Pa., will build a new one-story manual training building and power house at the local high school. Heacock & Hokanson, 1218 Chestnut Street, Philadelphia, are architects.

Electrically-operated pumping machinery will be installed in the proposed new sewerage pumping plant to be erected by the Borough Council, Westville, N. J., for which bids are being received until June 20. Remington & Vosbury, Camden, N. J., are engineers.

The New System Radiator Co., 437 Wyoming Avenue, Scranton, Pa., is planning for the installation of tools and other mechanical equipment.

The Suffolk Anthracite Collieries, Scranton, Pa., recently organized to take over the plants and properties of the Suffolk Coal Co., are planning for the installation of additional electric power and other equipment. A portion of a $1,000,000 bond issue now being sold will be used for the expansion.

Manual training equipment will be installed in the proposed new two-story high school to be erected at Larksville, Pa., estimated to cost $125,000. R. M. Herr, Simon Long Building, Wilkes-Barre, Pa., is architect.

The Lehigh Valley Coal Co., North River Street, Wilkes-Barre, Pa., is planning for the electrification of its Park No. 1 plant in the vicinity of Mahanoy City. A list of equipment to be installed will be arranged at an early date.

Fire, June 7, destroyed a portion of the plant of the Prizer Painter Stove Co., Fourth Street and Myrtle Avenue, Reading, Pa., with loss reported at $15,000, including equipment. It is planned to rebuild.

The Williamsport Water Co., Williamsport, Pa., is considering plans for the installation of electrically-operated pumping equipment and other machinery at its plant.

Manual training equipment will be installed in the new high school to be erected at West Philadelphia and Clinton Streets, West York, Pa., estimated to cost about $125,000, for which plans will be prepared at an early date.

Machinery to an amount of about $22,000, used for the manufacture of blasting powder at the plant of the Grasselli Powder Co., New Castle, Pa., was destroyed by fire June 6, in connection with a building. The equipment will be replaced.

Fire, June 3, destroyed the William Penn colliery plant of the Susquehanna Coal Co., Shenandoah, Pa., with loss estimated at about $1,000,000, including machinery. Tentative plans for rebuilding are under consideration.

The Steel Automobile Co., Barnesboro, Pa., is planning for the installation of a machine shop and parts department at its new two-story service building, 50 x 65 ft., for which plans are being prepared by J. Alfred Scollon, Barnesboro, architect.

Officials of the Lee Rubber & Tire Corporation, Conshohocken, Pa., are organizing the Republic Rubber Co. of Ohio, to be operated as a subsidiary. It will take over the plant of the Republic Rubber Corporation, Youngstown, Ohio, recently purchased by the Lee company for a consideration of $5,523,000. Extensions and improvements will be made.

Baltimore

BALTIMORE, June 11.

PLANS are being prepared for an addition to the machine shop of the Baltimore County Fire Department, Catonsville, Baltimore, to double the present capacity. Additional equipment will be installed.

The City Council, Walnut Cove, N. C., has authorized plans for a municipal hydroelectric power plant estimated to cost $90,000. The J. B. McCrary Co., Atlanta, Ga., is engineer.

The J. G. Skelton Co., Inc., Railway and Power Building, Richmond, Va., has inquiries out for second-hand dragline equipment, including buckets, skids, rollers and caterpillar trucks.

The Blue Mountain Stone Co., Hagerstown, Md., recently organized with a capital of $500,000, has leased the Blue-Black Slate Quarries, Delta, York County, Pa., and contemplates the erection of a new plant for the production of slate granules for use in roofing manufacture. Crushing, grinding, pulverizing and other machinery will be installed. The plant will cost $80,000.

The Atlantic-Gulf Refining Co., Atlanta, Ga., W. H. Beadley, representative, is perfecting plans for a new oil storage and distributing plant on the Cape Fear River, Wilmington, N. C., estimated to cost $150,000 with pumping and other machinery.

The Lynchburg Lumber Mfg. Co., Lynchburg, Va., has acquired the local plant of the American Box Co. Plans are under way for extensions and the installation of additional equipment. The American company will remove to its other plant at Memphis, Tenn.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until June 19 for one motor-generator set for the navy yard, Annapolis, Md., schedule 933.

Electrically-operated pumping machinery will be installed in the new water plant to be constructed by the Board of Water Commissioners, Hagerstown, Md., on the Potomac River, near Williamsport, Md. Major J. McPherson Scott, is chairman.

A one-story plant, 50 x 160 ft., will be erected by the National Asphalt Burial Vault Co., 2546 Edmondson Avenue, Baltimore, J. Henry Strohmeyer, president, to cost approximately $50,000, with machinery. Steam and electric power equipment will be installed.

The board of directors, University of South Carolina, Columbia, S. C., will install additional equipment in the power house. Lefaye & Lefaye, Loan & Exchange Building, are architects. Dr. W. D. Melton is president.

J. L. Barr, 202 North Calvert Street, Baltimore, consulting engineer, has inquiries out for a belt-driven ammonia compressor, with double pipe ammonia condensers, receiver and auxiliary equipment, for a refrigerating plant.

The Stark Mills, Inc., Hogansville, Ga., a subsidiary of the International Cotton Mills, Inc., 60 Federal Street, Boston, recently organized, plans the installation of a power house at its proposed mill, estimated to cost $400,000.

The General Purchasing Officer, Panama Canal, Washington, will receive bids until June 29 for mechanical equipment for the Canal zone, as set forth in Circular 1534, including steel and bronze rope, elevator switches and gears, switch locks, hacksaw blades, wrenches, jacks, etc., until June 18, similar equipment as specified in circular 2327, including 42 sets of twist drills, boiler, machine bolts, electric welding steel wire, galvanized wire cloth, wrenches, etc.

A machine shop and parts departments will be installed in the new three-story service building, 60 x 115 ft., at Washington and Spring Streets, Greenville, S. C., leased by the W. M. Thompson Motor Co. It will be erected by C. O. Allen, Greenville, at a cost of $150,000. J. E. Sirrine & Co., Greenville, are architects and engineers.

A power plant, machine shop and other buildings will be erected in connection with a new phosphate-fertilizer plant for a company represented by the Chemical Construction Co., Charlotte, N. C., Peter S. Gilchrist, president, in the vicinity of Tampa, Fla., estimated to cost $1,200,000, with machinery. Plans will be prepared under the direction of the company noted.

The Wilson-Hock Co., City Point, Va., machinery dealer, has inquiries out for a 48 in x 6 ft. lathe, with attachments; 16-in. shaper; universal milling machine, No. 2 Brown & Sharpe type; 24-in. planer; drill press; horizontal boring machine and tool grinder.

The Blue Ridge Stone Corporation, Pounding Mill Quarry Corporation and the Pembroke Limestone Corporation, Roanoke, Va., recently organized as affiliated companies with combined capitalization of $1,100,000, are considering plans for the installation of electric power equipment, quarrying

machinery, crushing and grinding equipment. J. P. Woods is president.

Henry Disston & Sons, Inc., Tacony, Philadelphia, has leased a two-story and basement building at 130-32 Marietta Street, Atlanta, Ga., for a factory branch.

S. E. Stahler, P. O. Box 1231, Hendersonville, N. C., is planning the installation of ice-manufacturing and refrigerating machinery in a local building and is inquiring for equipment.

The Pace Lumber Co., Hendersonville, N. C., plans the erection of a power house in connection with its proposed mill at Cayce, S. C. L. J. Pace is secretary.

The Randolph Auto Top Co., Norfolk, Va., recently organized, plans the establishment of a factory to manufacture automobile tops. Robert Randolph is president, and Robert A. Brock, secretary.

The Common Council, Heath Springs, S. C., will purchase equipment for a municipal electric station, including transmission apparatus.

A one-story power house will be constructed by the Wilmington Wood Products Co., Wilmington, N. C., in connection with its proposed mill, to cost approximately $60,000. The company was formed recently with a capital of $105,000. L. L. Merritt, Wilmington, is engineer in charge.

The Roanoke Street Railway & Electric Co., Roanoke, Va., is planning for extensions in its electric plant and system, estimated to cost $100,000. J. W. Hancock is general manager.

The Radford, Wright & Sanders Co., Howard and West Streets, Baltimore, manufacturer of doors, sashes and millwork, has taken over property at 614-18 West Pratt Street, where it will have an increase of about 50 per cent over present facilities. John W. Sanders is secretary.

Pittsburgh

PITTSBURGH, June 11.

THE local machine tool market shows improvement as compared with the past two weeks. Firms are figuring on a large amount of business which in some cases reaches the heaviest volume in number and value of tools since the war. Important sales are lacking but several individual tools out of dealers' stocks have been sold and there has been a good trade in used machinery. Among recent inquiries is one from the Westinghouse Electric & Mfg. Co. listing 75 tools for East Pittsburgh and its transformer plant at Sharon, Pa.

Cranes and steel plant equipment have not shared the improvement noted in machine tools. Steel manufacturers have prepared plans for important installations and the expenditure of large sums of money, but the disposition now seems to be to defer purchases. Plans of the Steel Corporation, involving the modernizing of some of its Pittsburgh district plants and extensions to others, appear to have been shelved for the present. Costs are extremely high at some of these plants because of obsolete equipment, but those in power to grant the appropriation evidently feel that the eventual saving would be long in accruing on the basis of today's costs.

Plans are being considered by the Reliance Window Glass Mfg. Co., Dubois, Pa., for rebuilding the portion of its plant recently destroyed by fire with loss of about $100,000, including machinery.

The receivers for the Pittsburgh Railways Co., 435 Sixth Avenue, Pittsburgh, are planning to purchase an electrically-operated grade shovel to cost about $10,000; also, 20 electric motors and other equipment. C. A. Fagan, W. D. George and S. L. Tone are receivers.

The Blanchard-Zanesville Mining Co., care of the Ebdy-Hemphill Co., 609 Fitzsimmons Building, 331 Fourth Avenue, Pittsburgh, organized under Pennsylvania laws to operate coal properties at Ellis, near Zanesville, Ohio, is disposing of a stock issue of $150,000, the proceeds to be used in connection with tipple construction and the installation of machinery at its plant. William G. Blanchard is president. He has also formed the Blanchard-Moshannon Mining Co., with capital of $800,000, to operate coal properties in Clinton County, Pa., where electric power and mining machinery will also be installed. Offices have been established in the Fulton Building, Pittsburgh. R. E. Allen is secretary and treasurer of the latter company.

The Lathwood Foundry Co., Thirtieth and Wayne Streets, Pittsburgh, manufacturer of rough and finished gray iron castings, will build a one-story addition to cost $16,000. J. A. Lathwood is head.

The Carbo-Oxygen Co., Twelfth and Raspberry Streets, Erie, Pa., is planning the erection of a new factory to manufacture commercial oxygen products.

Manual training equipment will be installed in the two-story and basement high school to be erected at East Washington, Pa., estimated to cost $125,000. George H. Schwan, 1310 Peoples' Building, Pittsburgh, is architect.

The Chicago Bridge & Iron Works, 608 South Dearborn Street, Chicago, will break ground for a one-story addition to its branch tank and plate shop at Greenville, Pa.

The Chambers Mfg. Co., Butler, Pa., manufacturer of farm lighting plants and other electrical equipment, has acquired a building at East Butler, and will remove to this location. Additional equipment will be installed.

The Mars Gasoline Co., Lewis Run, Pa., is planning for the installation of machinery and power equipment for a new refining plant.

The Continental Rubber Works, Inc., Liberty and Twelfth Streets, Erie, Pa., manufacturer of mechanical rubber products, etc., is planning the construction of a five-story addition, 75 x 102 ft., estimated to cost $60,000, including machinery.

The Pennzoil Co., Oil City, Pa., formerly known as the Oil City Oil & Grease Co., has leased property at 1739 Penn Avenue, Pittsburgh, for a new branch oil storage and distributing plant. Equipment will be installed at once.

Manual training equipment will be installed in the new two-story junior high school to be erected at Southmont, Pa., estimated to cost $110,000, for which bids have been asked on a general contract. Perry Campbell, Park Building, Johnstown, Pa., is architect.

The Oil Well Supply Co., Twenty-first Street and the Allegheny Valley Railroad, Pittsburgh, manufacturer of oil-well machinery, has filed plans for a one-story addition.

Manual training equipment will be installed in the new high school to be erected by the Brown's Creek District Board of Education, Welch, W. Va., to replace the school recently destroyed by fire, estimated to cost $130,000. Mahood & Van Dusen, Bluefield, W. Va., are architects.

The Appalachian Power Co., Bluefield, W. Va., has tentative plans for the construction of new generating plants and transmission lines estimated to cost $1,000,000. The company has recently increased its capital from $3,500,000 to $7,500,000 for expansion.

The American Specialty Glass Co., Wellsburg, W. Va., recently organized with a capital of $100,000, is planning the construction of new works to cost $50,000 with machinery. A. L. Rowing, Wellsburg; and John N. Dean, Wheeling, W. Va., head the company.

The Richland Coal Co., Clifton, W. Va., is disposing of a bond issue of $1,200,000, a portion of the proceeds to be used for extensions, including the installation of power and other equipment. J. C. McKinley is president.

Bids will be received by John P. Moore, County Controller, Court House, Pittsburgh, until June 27, for electric power and lighting equipment for the Liberty Tunnels, now in course of construction. A. D. Neeld, 708 Bakewell Building, Grant and Diamond Streets, is county engineer.

Buffalo

BUFFALO., June 11.

PLANS are being arranged by the Mayer Coating Machine Co., 205 St. Paul Street, Rochester, N. Y., for rebuilding the portion of its works recently destroyed by fire. Additional machinery will be installed.

The Niagara, Lockport & Ontario Power Co., Lockport, N. Y., is planning for extensions in its power plants and transmission system to develop a capacity of about 225,000 hp. A note issue of $3,000,000 is being sold, a large part of the proceeds to be used for the expansion. Fred D. Corey is president.

The Board of Education, Buffalo, has requested the City Council to provide a fund of $500,000 for the construction of a new vocational school to replace the Peckham vocational school, Peckham and Detroit Streets. Plans will be prepared soon.

John N. Todd, Palmyra, N. Y., for a number of years past connected with the local plant of the Garlock Packing Co., has organized the Palmyra Packing Co., with capital of $100,000, to establish a local plant for the manufacture of mechanical packings for locomotives and shop machinery. Mr. Todd will be president of the new company, and Frank W. Coats, vice-president, formerly acting in this same capacity for the Crandall Packing Co.

A manual training department will be installed in the new high school to be erected at Sherburne, N. Y., estimated to cost $125,000. J. Mills Platt, Cutler Building, Rochester, N. Y., is architect.

R. J. Cooper, 354 Lexington Avenue, Rochester, N. Y., has inquiries out for a drill press.

Fire, June 5, destroyed a portion of the works of the Penn Yan Boat Co., and the Penn Yan Lumber Co., adjoining, Penn Yan, N. Y., with loss estimated at $50,000, including equipment. It is planned to rebuild.

The New Campbells Point Association, Campbells Point, Sacket Harbor, N. Y., is planning for the installation of two chain hoists, 1½ and 2½ tons respectively, electrically-operated air compressor and other equipment. W. Alexander is head.

Card & Fetter, Endicott, N. Y., operating a woodworking plant, are planning the installation of a planer, conveying equipment and other machinery.

Manual training equipment will be installed in the proposed high school addition to be erected at Friendship, N. Y., estimated to cost about $125,000, for which an architect will be selected to prepare plans in the near future.

G. H. Simpson, Main Street, Rensselaer Falls, N. Y., is planning for the installation of a metal saw, power-operated, an air compressor and other equipment in the machine shop at his automobile service works.

Manual training equipment will be installed in the new three-story junior high school to be erected on Midland Avenue, Syracuse, N. Y., to cost in excess of $500,000, for which foundations will be laid at once.

The Fearless Dishwasher Co., Inc., 175 Colvin Street, Rochester, manufacturer of dishwashing machines, is considering plans for an addition to cost about $23,000, including machinery.

During the past week the machine tool equipment of the Berling Magneto Co., Buffalo, N. Y., was sold at auction and was purchased largely by users in Buffalo and vicinity. The list consisted of over 300 machines, including automatic machines, lathes, drill presses, grinders, punch presses, gear cutters and tapping machines. It is understood that most of the machinery brought very good prices.

Detroit

DETROIT, June 11.

ERECTION will begin on a new one-story foundry, 120 x 220 ft., at the plant of the Piston Ring Co., Muskegon, Mich., estimated to cost about $40,000. It will be ready for occupancy early in the fall. A new laboratory will be installed.

The Spaulding Electric Co., 1344 Michigan Avenue, Detroit, James G. Spaulding, president, is taking bids on a general contract for a new one-story plant on Michigan Avenue for repair and parts manufacture, estimated to cost $25,000.

The Nielson-Barton Chuck & Tool Co., Lawton, Mich., recently organized to take over the plant and business of Nielson & Barton, has plans for the erection of a new factory, 50 x 100 ft. Other units of like size will be built later. H. E. Barton and H. G. Nielson head the company.

The Howe Chain Co., Muskegon, Mich., will commence the erection of four new one-story buildings, of sawtooth type, to cost $25,000.

The Paige-Detroit Motor Car Co., Fort and McKinstry Streets, Detroit, has commenced foundations for its new plant on Warren Avenue, West, for the manufacture of the Jewett automobile. It will cost $300,000, including machinery. H. M. Jewett is president.

Cuchois Brothers & Joy, Lansing, Mich., manufacturers of automobile equipment, have taken over the building formerly occupied by the Gauss Baking Co., for a new plant. Production will be increased about 50 per cent over the former works.

The Checker Taxi Co., North Pitcher Street, Kalamazoo, Mich., will soon take bids for an addition to its automobile manufacturing plant. A portion of the structure will be equipped as a testing department. E. S. Batterson, Hanselman Building, is architect. L. F. Goodspeed is chief engineer.

The State Legislature, Lansing, Mich., has made an appropriation of $250,000 for a new power plant at the University of Michigan, Ann Arbor. A fund of $75,000 has also been approved for an addition to the power house at the Agricultural College, East Lansing, and for a new power house at the Marquette Prison, to cost $70,000.

The Michigan Copper & Brass Co., 5831 West Jefferson Street, Detroit, has commissioned Lane, Davenport & Peterson, Charlevoix Building, architects, to prepare plans for a two-story addition, 48 x 125 ft., to cost $30,000.

The Newaygo Portland Cement Co., Newaygo, Mich., has organized a subsidiary, the Manitowoc Portland Cement Co., Manitowoc, Wis., to build a local plant. A bond issue of $1,500,000 is being sold, the proceeds to be used for the new works, which will have an initial capacity of about 3000 bbl. per day. Clay H. Hollister is president.

The Hoover Ball Co., Ann Arbor, Mich., has reopened its plant at Chelsea, Mich., which has been closed since 1920. Some new equipment has been installed and at present it is operating at capacity, producing steel balls for bearings of all kinds. F. H. Lennox is assistant general manager and sales manager.

The former Jacquet motor plant, Belding, Mich., which has been idle for several years, has been sold to a group of Belding business men who will remodel it for the manufacture of furniture.

The Weibatch Liquid Scale Co., Grand Rapids, Mich., has been incorporated with a capitalization of $200,000 to manufacture scales. It is at present located at 45 Division Street, S., Grand Rapids. Officers are J. S. Townsend, president; A. E. Clark and W. H. Martineau, vice-presidents, and Charles E. Wilson, secretary-treasurer.

The Inland Automobile Corporation, Indianapolis, Ind., a recently organized company, capitalized at $200,000 will locate its plant at Grand Blanc, Mich., where it has purchased a nine-acre site. The first unit will be 75 x 400 ft.

The Lindell Drop Forge Co., Lansing, Mich., plans to erect a factory at once on a six-acre site on the New York Central Railroad, near the Atlas Drop Forge plant. The first unit will be devoted to die sinking, forging, heat treating, storage, power, machining, finishing and administration. The company is an outgrowth of the Lindell Tool & Die Co., which has been operating in Lansing for the past 13 years.

The Pere Marquette Railroad Co., Detroit, will make awards in the near future on a large amount of equipment under its recently announced expansion program. The list includes about 200 machine tools of various descriptions, the majority of which is for its Grand Rapids shops.

Chicago

CHICAGO, June 11.

THE Santa Fe started closing its pending list the past week and is expected to complete purchases within a few days. The orders will probably involve a total of not less than $300,000. The Elgin, Joliet & Eastern is expected to be the next road to take action against its inquiries.

Sales totals of local machine tool houses for May proved to be larger than was anticipated. Most of the business booked during the month consisted of single machines and for that reason estimates fell short of the actual figures. For one large house, the total sales ran $12,000 ahead of those for April, and it is probable that the May record generally was at least equal to that of April, although considerably below that for March. Business from industrial sources is still slack, although a number of sizable purchases have been placed or are pending. One local industry is in the market for about 10 large tools, including a turret lathe, planers and radial drills. Another company purchased two engine lathes, two shapers and a drill press.

Prices remain unchanged and no further advances are looked for.

The D. O. James Mfg. Co., manufacturer of gears, 1120 West Monroe Street, Chicago, has let contract for a three-story plant, 48 x 120 ft., and a two-story unit, 48 x 60 ft., at 1114-1118 West Monroe Street, to cost $75,000.

The Pyle National Co., 1338 North Kostner Avenue, Chicago, manufacturer of locomotive lighting equipment, searchlights, flood lights, etc., has awarded contract for a two-story buffing shop, 45 x 69 ft., at 1358-60 North Kostner Avenue, to cost $25,000.

The Illinois Bell Telephone Co., 212 West Washington Street, Chicago, has let contract for a one-story telephone exchange workshop addition, 32 x 89 x 96 ft., at 1622 Pratt Boulevard, to cost $55,000.

H. Jones, 1225 North Maplewood Avenue, Chicago, has awarded contract for a one-story machine shop, 50 x 100 ft., at 1647-9 West Fulton Street, to cost $12,000.

The Brunswick-Kroeschell Co., manufacturer of ice machines, 460 West Erie Street, Chicago, is erecting five plant buildings at 4201-5 Diversey Parkway, to cost $700,000. Included will be an administration building, machine shop, boiler room, pattern shop and storage and power house buildings.

John Penniwell, Leon, Iowa, is erecting a building to be occupied by the E. L. Cain machine shop and automobile accessory manufacturing establishment.

The Studebaker Corporation, South Bend, Ind., has awarded contract for a gray iron foundry, 650 x 750 ft., to cost $2,000,000.

The Doerr Mfg. Co., Grand Rapids, Mich., recently organ-

ized with $100,000 capital stock, is remodeling part of the Richards Storage Co. building, Michigan Street and Ionia Avenue, into a manufacturing plant and will take possession July 1. The company will make the "smoke-a-dor" combination case, match holder and ash receiver and other novelties. Officers are: President, F. H. Doerr; vice-president, L. H. Wallace; secretary, W. B. Warren; treasurer, W. J. Wallace.

The Sly Machine & Supply Co., Peoria, Ill., recently organized, has secured a site in the 700 block, South Washington Street, and will immediately start the erection of a three-story factory. It will manufacture superheaters for boilers, stacker hoods, etc., and will do a jobbing business in threshing machinery and mill supplies.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, has taken bids on a machine shop at Fisk Street and the Chicago River.

W. D. Foreman, manufacturer of axle shafts and other automobile equipment, now at Prairie Avenue and Sixteenth Street, Chicago, has purchased a one and two-story factory at the northeast corner of State and Fifty-fourth Streets, 99 x 163 ft., and has acquired vacant property, 50 x 163 ft., adjacent, where he will erect an addition.

A manual training department will be installed in the new two-story high school to be erected at Slayton, Minn., estimated to cost $125,000, for which bids on a general contract will soon be called. Lang, Rauhgland & Lewis, 627 Metropolitan Bank Building, Minneapolis, Minn., are architects.

The Carroll County Drainage & Levee District No. 1, H. P. Greison, Savanna, Ill., will receive bids until June 26 for an oil-engine operated pumping plant, with 30-in. double suction centrifugal pump and auxiliary equipment. The Elliott & Harmon Engineering Co., 144 Fredonia Street, Peoria, Ill., is engineer.

The Dubuque Electric Co., Dubuque, Iowa, is disposing of a bond issue of $3,000,000, a portion of the proceeds to be used for extensions in power plants and system. Albert Emanuel is president.

The Metropolitan Utilities District, Omaha, Neb., will build an addition to the power house at its Florence plant to cost about $75,000.

The Consumers Oil Co., Blue Island, Ill., will rebuild the portion of its plant destroyed by fire May 30, with loss estimated at $25,000.

The Northern States Power Co., Minneapolis, Minn., has arranged an appropriation of $8,500,000 for extensions and improvements in its power plants and system during the year, to include an addition to the Riverside plant at Minneapolis to cost $1,300,000 with machinery; an extension to the Highbridge steam-operated electric generating plant at St. Paul, Minn., to cost $2,000,000, with equipment, and additions to the power plants at Fargo, N. D., and Sioux Falls, S. D.

A manual training department will be installed in the two-story high school to be erected at Oelwein, Iowa, estimated to cost $200,000, for which bids will be received on a general contract until June 27. William Gordon, Hubbell Building, Des Moines, Iowa, is architect.

The Pettibone Mulliken Co., 4710 West Diversey Street, Chicago, manufacturer of railroad equipment, will make extensions and improvements in its foundry to cost $25,000.

The Hammond-Byrd Iron Co., 122 South Michigan Avenue, Chicago, cast iron pipes, etc., is considering plans for a new one-story and basement building at its works, Loomis Street and Thirty-seventh Place, estimated to cost $30,000. William M. Byrd is head.

Cleveland

CLEVELAND, June 11.

MACHINE tool business was light the past week, compared with the previous few weeks. Orders were mostly for one or two machines. Local builders are still working on a number of railroad lists which have come out recently, none of this business having as yet been placed. Among new inquiries is one for 12 machines and another has come from the Ford Plate Glass Co., Toledo, Ohio, for three machines, a boring mill, lathe and punch and shear.

With the view of possibly replacing part of their present tools with more modern equipment, some Detroit automobile companies have made tentative inquiries for round lots of machinery. However, the purchasing is still in a very indefinite state and if the tools are finally bought it will probably not be for some time or until they are wanted for 1924 production.

The Steelcraft Parts Co., Cleveland, recently incorporated with a capital stock of $100,000, will take over the plant of the Structural Tool Co., 3160 West 106th Street, Cleveland, to manufacture rivet sets, chisel blanks, punches and punch dies, and some screw machine products. The new organization is composed of officers of the Cleveland Wrought Products Co. The officers are Charles L. Wasmer, president; Carl Kramer, vice-president; John C. Wasmer, secretary, and James J. Lally, treasurer.

The plant of the Electric Furnace Co., Salem, Ohio, manufacturer of electric heating and melting furnaces, has been purchased by R. F. Benzinger and F. A. Hoyles, Alliance, and F. T. Cope, Salem. The business will be under the management of Mr. Cope, who had long been connected with the old company. Mr. Benzinger will have charge of the sales department.

The Bellaire Enameling Co., Bellaire, Ohio, will erect several factory buildings, including one to be used for an enameling plant and another for a press room.

The Fostoria Pressed Steel Co., Fostoria, Ohio, will erect an addition, 50 x 220 ft., for warehouse purposes.

The Sterling-Knight Co., Warren, Ohio, has been organized to take over the business of the Sterling-Knight Motor Co., Cleveland, which has been conducting experimental work in connection with bringing out a new model of automobile. It has purchased the plant of the Supreme Motors Co., Warren, which is equipped with considerable machinery. The company will have a capital stock of $1,500,000.

Milwaukee

MILWAUKEE, June 11.

SALES of machine tools the past week showed an increase over the preceding two weeks, while inquiry was more active. This has given the trade a much better tone and given foundation for hopes of continued active business. It is to be noted, however, that construction of new shops and enlargement of existing shops is still declining, and with it the requirements of tools has been dropping off, yet pressure of existing orders is such that many concerns are providing as much additional capacity as the limitations of buildings and the supply of labor will permit. The A. O. Smith Corporation, Milwaukee, pressed steel and forged automobile parts, is continuing purchases of miscellaneous equipment, largely of special automatic design for pressing, stamping and punching.

The A. J. Lindemann & Hoverson Co., Milwaukee, Wis., manufacturer of stoves, ranges and heaters, has placed the general contract with Klug & Smith, consulting engineers, 69 Wisconsin Street, for a brick and concrete addition, 111 x 113 ft., at Twenty-third and Cleveland Avenues. Inquiry is being made for miscellaneous equipment.

The Muscoda Mfg. Co., Muscoda, Wis., manufacturer of furniture and hardwood specialties, will build a two-story addition, 60 x 120 ft., and is in the market for woodworking machinery with individual electric motor drive. The investment will be about $45,000. J. F. Bilba is president.

The B. F. Sturtevant Co., Hyde Park, Boston, Mass., is putting out inquiries for a large list of new equipment for the manufacture of blowers and ventilating systems which will be needed for retooling the works of the former Wisconsin Engine Co. at Corliss, Racine County, Wis., recently acquired. The plant was idle about six years, during which time the Corliss engine production machinery was removed while use of the buildings was made by the Government as a salvage warehouse. Harry W. Page, Boston, has been appointed works manager at Corliss.

The Newaygo Portland Cement Co., Newaygo, Mich., has completed arrangements whereby the proposed new cement producing plant will as originally projected be established at Manitowoc, Wis. The operation will be conducted as the Manitowoc Portland Cement Co. Contracts have been let by the Common Council of Manitowoc for dredging work. Contracts for the construction of buildings will be let about July 1. The investment will be approximately $1,000,000. The so-called wet process of cement production will be employed. L. E. Geer and C. C. West of the Manitowoc Ship Building Corporation are representing the Michigan interests in the project.

The MacKinnon Mfg. Co., Wisconsin Rapids, Wis., will invest about $40,000 in rebuilding and retooling an existing warehouse building into a factory for the production of automobile bodies, truck bodies, cabs, etc.

The St. Louis Automobile Corporation, St. Louis, which for the past year has been manufacturing a high grade passenger automobile, is seeking a site in or near Milwaukee for its permanent location, according to J. M. Neskov, presi-

dent and general manager, who is in Milwaukee to confer with the new industries committee of the Milwaukee Association of Commerce. No decision has as yet been made.

Sale of the plant and other assets of the bankrupt Barton Axle Co. of Barton, Washington County, Wis., to W. L. Huffman and R. L. Huffman of Elkhart, Ind., for $76,000 has been confirmed and the new owners are planning to resume the operation July 1, making motor truck axles for their plant in Elkhart as well as for the commercial market. Some retooling will be necessary and inquiry is now being made for machinery.

The Modern Auto Repair Co., 2410-2418 State Street, Milwaukee, has plans by H. T. Schramek, architect, for a brick and steel repair shop addition, 110 x 125 ft., one story and part basement, costing about $35,000 exclusive of additional equipment. This will be purchased after July 1. Fred B. Wutschel is general manager.

The Board of Education, Viroqua, Wis., is taking bids until June 18 for a new high school with vocational training departments, estimated to cost $190,000. The architect is E. J. Hancock, Eau Claire, Wis. W. F. Lindemann, Bank of Viroqua, is president of the board.

The Dostal & Lowey Hydro Co., Milwaukee, has been incorporated with a capital stock of $25,000 to manufacture special machinery for washing and sterilizing milk and beverage bottles and other bottling plant equipment. The incorporators are John R. Dostal and John R. Lowey, who have been operating executives of the Twentieth Century Machinery Co., 394 Greenbush Street, for many years. This concern is engaged in the bottling machinery industry. Plans for production have not been announced.

The Village Board of Trustees, Little Chute, Wis., is taking bids until June 19 for the construction and equipment of a municipal waterworks system costing $75,000. The equipment needed includes two 2-stage 500 gal. per min. centrifugal pumps, with electric motor drive and auxiliaries, and a 100,000-gal. steel tank on a 100-ft. steel tower. A. E. McMahon, Menasha, Wis., is consulting engineer.

Indiana

INDIANAPOLIS, June 11.

BIDS will soon be asked by the McCray Refrigerator Co., Kendallville, Ind., for the erection of a one-story addition, 75 x 220 ft. A. M. Strauss, 701 Schoaff Building, Fort Wayne, Ind., is architect. C. C. Allin is general superintendent.

The Interstate Public Service Co., Indianapolis, has plans for an addition to its steam-operated electric generating plant at Goshen, Ind., acquired from the Hawks Electric Co. a number of months ago. The capacity will be doubled. Extensions will also be made in the transmission system. The work is estimated to cost $200,000, including machinery.

The Esterline-Angus Co., 227 East South Street, Indianapolis, manufacturer of graphic meters for testing power apparatus and other precision instruments, has acquired the former plant of the Highway Tractor Co., Speedway City, near Indianapolis, consisting of a main building, 100 x 200 ft., on 2-acre site. The present works will be removed to the new location and additional machinery installed. Other buildings will be constructed later. J. W. Esterline is president.

The Boland & Hoard Ice Cream Co., Anderson, Ind., is planning for extensions in its ice and refrigerating plant and the installation of additional equipment.

A manual training department will be installed in the new junior high school to be erected at Fort Wayne, Ind., estimated to cost $400,000, for which Karl D. Norris, Calumet Building, architect, has been commissioned to prepare plans.

The Elgin Motors, Inc., Argo, Ill., recently organized by stockholders of the former Elgin Motors Co., has acquired the property of the company from the receiver. The former plant of the Federal Motor Works, 323 West Fifteenth Street, near Senate Avenue, Indianapolis, has been purchased from the Willys-Overland Co. for about $100,000. It consists of a main three-story building and two smaller structures, totaling 100,000 sq. ft. of floor space. The plant will be remodeled and improved and machinery installed for the manufacture of a six-cylinder automobile. Joseph H. McDuffee, formerly assistant general manager of the Cole Motor Car Co., is president of the new Elgin company.

The Consolidated Motors Corporation, Kokomo, Ind., has been formed under Delaware laws with capital of $19,000,000 to take over and merge the Haynes Automobile Co., Kokomo; the Dorris Motor Car Co., St. Louis, and the Winton Co., Cleveland. Each organization will be maintained as a unit of the new company. Tentative plans are under way for expansion, to include enlargements at the Haynes plant for the production of cars on a quantity basis.

The Southern Indiana Gas & Electric Co., Evansville, has secured permission to purchase the property of the Mount Vernon Electric Light & Power Co., Mount Vernon, Ind., for $155,000. Plans are being perfected for extensions and improvements in the power house and system and the installation of additional equipment.

Robert H. Hassler, Inc., 1535 Naomi Street, Indianapolis, manufacturer of automobile shock absorbers, has acquired an adjoining building for $50,000. It will be remodeled and machinery installed. The company has also secured property near its works and will have plans drawn for a three-story addition to cost about $100,000. Robert H. Hassler is president.

Cincinnati

CINCINNATI, June 11.

THE machinery market is dull as far as orders are concerned, but inquiry is still good, though mostly for single machines. Extensive railroad buying is, however, expected to make up a fair month's business. The Santa Fe has commenced purchasing on its recent list, and other roads are also expected to take action on the lists recently issued. The Joyce-Cridland Co., Dayton, Ohio, has issued an inquiry for 6 engine lathes. This is the largest new list reported.

The Hauser-Stander Tank Co., Cincinnati, manufacturer of tanks, will erect an addition to cost $12,000.

The Langhaar Ball Bearing Co., Cincinnati, has been incorporated with a capitalization of $15,000. It has taken over the plant at Aurora, Ind., formerly operated by the Indiana company of the same name. B. Lee Hutchinson, Union Central Building, Cincinnati, is president of the company, which will continue to manufacture ball bearings at the Aurora plant.

The Champion Coated Paper Co., Hamilton, Ohio, will erect an addition to its present plant, part of which will be given over to the manufacture of paper and the remainder to warehouse space. Paper making machinery will be installed in the addition.

The Printing Index Co., Dayton, recently incorporated to manufacture a new type index for reading and registering gas and electric meters, will locate its plant in Wilmington, Ohio. The company's offices are in the Murphy Building, Wilmington.

The Foster Stove Co., Ironton, Ohio, which is building an addition, has purchased adjacent property and contemplates further extensions.

The Athens Foundry & Machine Co., Athens, Ohio, has been purchased by D. L. Wallace, coal operator, Nelsonville, Ohio. The new management contemplates the erection of a number of buildings, and will modernize the equipment. It also contemplates erecting a shop for the manufacture of mine cars.

H. O. Swoboda, Inc., consulting electrical and mechanical engineer, Empire Building, Pittsburgh, has been engaged by the city of East Palestine, Ohio, to prepare plans and specifications for an additional unit to the municipal plant.

The Central South

ST. LOUIS, June 11.

ARRANGEMENTS are being perfected by the Lee Duncan Electric & Mfg. Co., 4441 Manchester Avenue, St. Louis, recently organized, for the establishment of a new plant to manufacture electric motors and fans. A list of machinery will be prepared at once, to include lathes, milling machines, screw machines and punch presses. Lee J. Duncan is president.

The Ford Motor Co., Highland Park, Mich., has tentative plans for a new assembling plant at Memphis, Tenn., to more than triple the capacity of the present works. It is purposed to dispose of the latter factory and remove the machinery to the new buildings.

The Heating Range Mfg. Co., Kansas City, Mo., A. L. Smith, 312 West Eighth Street, president, is considering plans for the erection of a new one and two-story factory, to cost $50,000 with machinery.

The Foster Machine Shop, 523 Webb Street, Wichita, Kan., plans the installation of a drill press. C. Foster is head.

The Southwestern Utilities Co., Independence, Kan., operating oil plants, gas works and other utility properties, is disposing of a note issue of $1,700,000, a portion of the proceeds to be used for extensions, including the installation of additional equipment. Paul R. Johnson is vice-president.

The Chattanooga Wheelbarrow Co., Fourteenth Street and the Belt Railroad, Chattanooga, Tenn., has plans for

a new one-story factory, 60 x 125 ft., for the manufacture of steel wheelbarrows. R. C. Dillingham, Jr., is general manager.

The Sinclair Consolidated Oil Corporation, 45 Nassau Street, New York, will extend and improve its various oil and gasoline refining plants at Kansas City, Houston, Tex. and Coffeyville, Kan.; Cushing, Okla.; and East Chicago, Ind. Considerable machinery and power equipment will be installed. The work will cost in excess of $500,000. The company is also building a new refinery at Marcus Hook, Pa., and will soon commence the installation of machinery.

The Bridgeport Machine Co., Wichita, Kan., is planning for the installation of lathes, a boring mill and other equipment at North Wichita.

The American Cornice Works, 241 North Water Street, Wichita, Kan., has awarded contract to the George H. Siedhoff Construction Co., Broadview Hotel Building, for a new two-story and basement plant, 25 x 130 ft. Roy Buckley is secretary.

The Krippendorf-Tuttle White Cliffs Products Co., White Cliffs, Ark., operating talc and other local properties, is planning for the installation of crushing and pulverizing machinery; also oil-burning equipment for boiler and kiln service.

The Superior Oak Flooring Co., West Helena, Ark., will build an addition to its local mill and install new machinery, including electric power equipment. It is purposed to increase the output to more than 2,000,000 ft. of hardwood flooring per month.

Manual training equipment will be installed in the high school to be erected at Monroe City, Mo., estimated to cost $90,000. Bonsack & Pierce, Laclede Gas Building, St. Louis, are architects.

The Michael & Ferguson Hardware Co., Paducah, Ky., manufacturer of metal and hardware specialties, is considering the erection of a new three-story and basement plant, 57 x 150 ft., to cost approximately $27,000.

The Duncan Machinery Co., P. O. Box 265, Knoxville, Tenn., machinery dealer, is making inquiries for saw mill machinery, including an 8 ft., left-hand band saw, used or rebuilt, and auxiliary equipment.

The Atchison, Topeka & Santa Fe Railroad Co., 80 West Jackson Boulevard, Chicago, will build a new reinforced-concrete coaling station at Argentine, Kan., with mechanical operating equipment, designed for a capacity of 1000 tons. The company will also build a similar plant at La Junta, Colo., with capacity of about 600 tons.

A manual training department will be installed in the new two-story junior high school to be erected on the Colby Pike, Winchester, Ky., estimated to cost $110,000. R. M. Bates, Watts Building, Huntington, W. Va., is architect.

The Knott Coal Co., Roanoke, Va., is planning the construction of a tipple at its properties near Whitesburg, Ky. The company will also open new mines, and proposes to install electric power and other machinery. The capital was increased recently to $500,000 for general expansion. L. N. Buford is president.

The Wise Mfg. Co., P. O. Box 1202, Tulsa, Okla., recently organized, has perfected arrangements for an initial plant to manufacture springs, automobile snubbers, etc., at Oklahoma City, Okla. W. K. Wise is president and S. C. French, secretary-treasurer.

The Missouri Pacific Railroad Co., St. Louis, will build a new one-story and basement engine house and repair shop, 120 x 160 ft., at Twenty-fifth and Cleveland Streets, Wichita, Kan., for which a general contract has been awarded to H. W. Underhill & Co., Wichita.

The Bagley Machine Shop, Caldwell, Kan., is planning for the installation of a lathe, drill press and other equipment. J. Bagley is head.

The Common Council, Covington, Tenn., has tentative plans for the construction of a municipal electric power plant, to cost about $35,000.

The Paducah Electric Co., Paducah, Ky., has commissioned Stone & Webster, Inc., 117 Milk Street, Boston, engineer, to prepare plans for a one-story power plant addition, 25 x 105 ft. The capacity will be increased about 2500 kw. Coal-handling and conveying equipment will be installed. The work is estimated to cost $370,000, including machinery. Other units will be constructed later.

Fire of undetermined origin recently destroyed the main plant of the Warren Steel Castings Co., 3400 Maury Avenue, St. Louis, with damage estimated at $100,000.

The Knoxville Power & Light Co., Knoxville, Tenn., has applied for permission to build and operate hydroelectric power plants on the Holston River, with total capacity of 150,000 kw. Col. C. H. Harvey is president.

The Kentucky Utilities Co., Pineville, Ky., has awarded contract for foundation and building for a new electric generating plant to the Foundation Co., 120 Liberty Street, New York. It will cost in excess of $250,000. A list of machinery will soon be arranged.

The Wesco Supply Co., Seventh and Clark Streets, St. Louis, electrical products, has acquired the Electric Supply Co., Memphis, Tenn., and the Gulf States Electric Co., New Orleans. The new properties will be operated as branch units and will be extended. J. L. Buchanan is president of the purchasing company.

Plans are being prepared for the construction of a one-story power house at the Tennessee School for the Deaf and Dumb, Knoxville, to cost approximately $50,000. Barber & McMurray, Knoxville, and Marr & Holman, Nashville, Tenn., are associated architects.

The St. Louis & San Francisco Railroad Co., St. Louis, has called for bids on a general contract for the construction of its car and locomotive repair shops on Fyler Avenue, Lindenwood, near St. Louis, estimated to cost $500,000 including equipment. J. G. Jonah is chief engineer.

A machine shop and parts department will be installed in the one-story and basement automobile service building, 100 x 140 ft., to be erected at Denver and Brady Streets, Tulsa, Okla., by John Thomas, 118 East First Street, estimated to cost $38,000.

The City Water Co., Chattanooga, Tenn., has plans for extensions and improvements in its power house and central pumping station at Citico, to include the installation of electrically-operated pumping machinery, boilers with automatic stokers and auxiliary equipment. An appropriation of $150,000 has been made for the work. C. F. Porzelius is manager.

Electrically-operated pumping equipment will be installed at the municipal waterworks at Lathrop, Mo., in connection with extensions and improvements to cost $60,000. E. T. Archer & Co., New England Building, Kansas City, Mo., are engineers.

Catalogs Wanted

The Manufacturers' Soap & Chemical Co., Cleveland, Tenn., desires catalogs of chemical machinery, especially handling and mixing machines.

The Pacific Coast

SAN FRANCISCO, June 6.

PLANS are being completed for the erection of a new one-story factory, 45 x 150 ft. on Orange Drive, for the A. J. Braasch Heater Co., 5833 Santa Monica Boulevard, Los Angeles. Hamm & Grant, Inc., 607 Ferguson Building, are architects.

A one-story power house, machine shop and other buildings will be erected at the proposed pottery of the French China Co., Sebring, Ohio, on site now near Los Angeles, to cost $1,000,000, with machinery. O. H. Sebring is president.

The Doble Steam Motors Co., 714 Harrison Street, San Francisco, has awarded a contract to the Lindgren Co., Monadnock Building, for the first unit of its proposed plant at Emeryville, Cal., comprising a two-story works, 82 x 262 ft., with foundations designed for three additional stories. It will cost about $125,000.

The American River Water & Power Co., Auburn, Cal., has made application to construct a hydroelectric power plant on the middle fork of the American River, with capacity of 150,000 hp., to cost in excess of $600,000, with machinery.

The Oregon Pulp & Paper Mill, Inc., Salem, Ore., will take bids at once for a two-story and basement addition, 128 x 220 ft., estimated to cost $100,000, including machinery. Knighton & Howell, United States Bank Building, Portland, Ore., are engineers.

The Seibel Air Spring Co., Inc., Hueneme, Cal., Charles Pilgrim, local representative, has preliminary plans for a one-story building, 100 x 200 ft., to cost about $30,000.

The West Coast Laundry Machinery Co., 3246 Seventeenth Street, San Francisco, has plans for a two-story addition, to cost $17,000 exclusive of machinery. P. Righetti, 12 Geary Street, is architect.

The Peshastin Lumber & Box Co., Blewett, near Wenatchee, Wash., has tentative plans for the rebuilding of the portion of its mill and power house recently destroyed by fire with loss estimated at $50,000.

The Western States Gas & Electric Co., Stockton, Cal., is disposing of a bond issue of $2,000,000, the proceeds to be used in connection with the construction of a new hydroelectric power plant on the south fork of the American River, with capacity of 20,000 kw. The company is operated by the Byllesby Engineering & Management Corporation, 208 South La Salle Street, Chicago.

The Rogers Una-Drive Motor Truck Co., Glendale, Cal., has acquired 9 acres near the Colorado Boulevard and San

Fernando Road, and plans the erection of new works to manufacture motor trucks. Plans for the first unit, totaling 150,000 sq. ft. of floor area, are being prepared at the office of the Roy L. Kent Co., 130 South Brand Boulevard. H. C. Powell is treasurer and general manager.

The A. F. Gilmore Co., 210 West Seventh Street, Los Angeles, operating the Gilmore Petroleum Co., is negotiating for a site at Ventura, for the construction of a new oil refinery to cost $60,000.

The Campbell Oil Co., Shelby, Mont., is considering plans for a new refinery in the vicinity of Seattle, Wash., estimated to cost $200,000 with machinery. The company is represented in Seattle by Ray M. Wardall and Winter S. Martin, attorneys, L. C. Smith Building.

The Salinas Valley Ice Co., Soledad and El Sausal Streets, Salinas, Cal., will make extensions in its ice-manufacturing plant, including the installation of new machinery, to cost about $35,000.

The Municipal Power Department, Los Angeles, has made application to construct two hydroelectric generating plants on Big Pine Creek and Cottonwood Creek, estimated to cost $3,188,000 and $1,936,000.

The Northwest Lead Co., 1742 Fourth Street, Seattle, is contemplating the construction of a new fabricating plant in the bay district, San Francisco, to cost approximately $300,000 with machinery. John T. Lund is president.

The Gulf States

BIRMINGHAM, June 11.

CONSTRUCTION will soon commence on a new one-story plant, 100 x 150 ft., by the Ideal Cap Co., Ltd., Nashville, Tenn., at Gadsden, Ala., for the manufacture of radiator caps for automobiles, gas tank caps and kindred specialties. The company was organized recently with L. B. Rainey, Gadsden, as president.

The Faust Brothers Lumber Co., Monroe, La., plans the erection of a power house at its new hardwood mill on 35-acre site recently acquired near Jackson, Miss., estimated to cost $100,000.

The Hill-Curtis Co., Kalamazoo, Mich., is considering the construction of a branch plant near Jackson, Miss., for the manufacture of sawmill machinery. It will include an assembling department.

The Common Council, Denton, Tex., has called a special election July 7 to vote bonds for $90,000 for the installation of a municipal electric light and power plant, and extensions in the waterworks system.

The Texas Steel Co., Fort Worth, Tex., has taken out a charter under Delaware laws with capital of $5,000,000 and will succeed to the plant and business of the Armstrong Steel Co. The works will be converted into an electric steel plant for the manufacture of steel reinforcing bars, steel castings and kindred products. Tentative plans are being considered for enlargements in the oil well equipment department, to include the installation of additional machinery. A foundry for gray iron casting production is also contemplated. The new company is headed by John H. Kirby, Houston, Tex., oil operator.

The Southern Rock Asphalt Co., Flint, Ala., recently formed with a capital of $600,000, has tentative plans for a new refinery to cost in excess of $150,000 with machinery. A power house will be built. L. D. Powell is manager.

The Calcasieu Mfg. Co., Elizabeth, La., operating a pulp and paper mill, has plans for an addition and the installation of machinery. The company recently advanced its capital from $250,000 to $350,000 for expansion.

The Board of Trustees, Starke, Fla., will take bids until June 26 for electrical equipment for a municipal electric light and power plant, including two complete generating units, operated by crude oil engines, each with capacity of 75 kva.; two electrically-operated impeller pumps, submerged type, to operate under a 100 ft. and 150 ft. head, respectively; storage tank, meters and auxiliary equipment, as per specifications on file at the office of Joseph E. Craig, 427 King Street, Jacksonville, Fla., consulting engineer.

Pending a decision regarding location for permanent shops, the Fort Worth & Denver Railroad Co., Fort Worth, Tex., will construct temporary locomotive and car repair shops at Childress, Tex., to replace the plant recently destroyed by fire with loss of about $250,000. F. E. Clarity is vice-president and general manager.

A manual training department will be installed in the proposed high school to be erected at Court Street and Semmes Avenue, Montgomery, Ala., estimated to cost $500,000. The Board of Education, L. C. Cardinal, president, is in charge.

M. E. Fidler, R. F. D. No. 1, Miami, Fla., is organizing a company to build a plant for the manufacture of mechanical toys, metal specialties, etc. A list of machinery will be arranged at once, to include lathes, drill press and milling machine.

The Murray Tire Co., Birmingham, has work in progress on a new plant at Twenty-seventh Avenue and North Twenty-sixth Street, for the manufacture of automobile tires and other rubber products, to cost in excess of $70,000, with machinery. The company recently increased its capital to $200,000, for general expansion.

The Common Council, Hollywood, Ala., is making inquiries for electrically-operated pumping machinery for the municipal waterworks. Prices are also being asked on oil-engine operated equipment. J. C. Wall is engineer in charge.

The Bionville Mfg. Co., New Orleans, has arranged for the establishment of a plant at 508 Magazine Street to manufacture a patented rotary saw, metal wire specialties, etc. Edward Michel is president.

The Louisiana Utilities & Mfg. Co., Hammond, La., recently organized with a capital of $1,000,000, has plans for extensions in its local power house, including the installation of additional machinery. A new ice-manufacturing and cold storage plant, to cost in excess of $80,000, will also be built. H. G. Hungate is secretary.

The Alabama Interstate Power Co., Birmingham, a subsidiary of the Alabama Power Co., has secured permission to build a hydroelectric generating plant on the Tallapoosa River, near Cherokee Bluffs, Ala., with total capacity of 105,000 hp. It will cost in excess of $1,000,000, with machinery.

A manual training department will be installed in the new high school to be erected at Eufaula, Ala., for which bonds for $100,000 have just been voted. An architect will soon be selected.

The Florida China Clay Co., Leesburg, Fla., will install additional mining and power equipment at its properties, including grinding and pulverizing machinery for considerable increase in capacity. The company was formed a few months ago with a capital of $500,000. J. S. Morris is president and general manager and L. A. Morris, secretary and treasurer.

The Roesch Paper Co., Franklin and Hampton Streets, Tampa, Fla., is planning the erection of a new three-story paper mill, 100 x 150 ft., on South Florida Avenue. It is proposed to install machinery to treble the present capacity. Henry Roesch is president.

The San Antonio Public Service Co., San Antonio, Tex., has work in progress on enlargements in its generating plant, to increase the capacity about 20,000 hp. The company recently arranged for a fund of $500,000, a large part of the proceeds to be used for expansion.

The Appropriation Committee, State Legislature, Austin, Tex., has approved of a fund of $1,526,500 for a college of mines and metallurgy. A similar appropriation has been arranged for the second year, the entire fund to provide for building and equipment.

The Baltic Gas Co., Ranger, Tex., recently organized, has acquired property about 20 miles from the city and plans the construction of a new gasoline refinery, to cost approximately $75,000 with equipment. R. W. Thomas and Charles Terrell, Ranger, head the company.

Electric power equipment, presses, die machinery, etc., will be installed in the plant to be erected by the Dallas Pottery Co., Dallas, Tex., in the Love Industrial Field, to cost about $75,000. A tract of 7½ acres of land has been acquired for future extensions. Taylor Jackson is general manager.

The Capital Ice Co., Jackson, Miss., recently formed with a capital of $100,000, has tentative plans for the erection of an ice-manufacturing and cold storage plant. W. M. Wright is president.

The Childersburg Brick Co., Childersburg, Ala., recently organized with a capital of $250,000, is considering the erection of a new plant, with power house and machine shop, estimated to cost $100,000. L. L. Stephenson, Sr., heads the company.

The Acme Oak Flooring Co., Hattiesburg, Miss., has been formed with a capital of $500,000 to equip a local mill to cost in excess of $100,000 with machinery. A power house will be built. D. P. N. Hackney is head.

Recommendations of a committee of voting trustees of the stockholders of the Kilbourne & Jacobs Mfg. Co., Columbus, manufacturer of dump cars and other products, for a refinancing of the company, have been submitted to the stockholders. The plan provides for the raising of $300,000 working capital, to be assessed at the rate of $15 per share against the 20,000 shares of stock outstanding. For stockholders who do not wish to subscribe, the committee has made a tentative offer to buy their stocks at $5 per share for the preferred, and $1 per share for the common. The plant is operating under the direction of Paul Norton, receiver, and during the first quarter of the year showed a profit of slightly over $81,000.

Trade Changes

The Uehling Instrument Co., Paterson, N. J., manufacturer of CO_2 recorders and draft and vacuum gages, has appointed the Amsler-Morton Co., Fulton Building, Pittsburgh, agent for western Pennsylvania and John A. MacDowell, 2039 Railway Exchange Building, St. Louis, for eastern Missouri and southern Illinois. H. R. N. Johnson, who formerly represented the Uehling company in Minnesota and the Dakotas, has joined the W. P. Nevins Co., 120 South Ninth Street, Minneapolis, this company being now the Uehling representative in the territory mentioned.

Owing to the recent fire which destroyed its plant at South Sudbury, Mass., the Huribut, Rogers Machinery Co., patent cutting-off and centering machines, has located at Nashua, N. H., with larger facilities.

The Pennsylvania Crusher Co. has moved its Pittsburgh offices from the Peoples Bank Building to the Oliver Building, where operations will be continued under the management of H. M. Hallett.

The Link-Belt Co., Chicago, announces that L. M. Dalton has succeeded E. J. Burnell as manager of the Boston office. Mr. Burnell resigned to go into business for himself. The company's Cleveland office has been changed from Room 429 to 329, Rockefeller Building.

The Koppers Co. has opened a district office at 1709 Peoples Gas Building, Chicago. Angus MacArthur, formerly superintendent of the coke plant, Chicago By-Product Coke Co., Chicago, has been appointed district engineer in charge.

The Blaw-Knox Co., Pittsburgh, has obtained exclusive license to manufacture and sell Blair water cooled ports, reversing valves and removable slag pockets.

The Triplex Machine Tool Corporation, 50 Church Street, New York, has appointed the Andrews & George Co., Tokio, Japan, exclusive sales agents in Japan and Manchuria for the Triplex combination bench lathe, milling and drilling machine.

The Pullman Co., Chicago, will manufacture automobile bodies, having taken a contract for 500 closed bodies of the sport sedan type for the Moon Motor Car Co.

The Niagara Blower Co., Buffalo, has opened a new plant at Ontario Street and New York Central Tracks, where it is equipped to fabricate plates of any size, ⅜ in. and lighter, and large-size sheet steel shapes.

Joseph G. Worker, receiver of the Phoenix Mfg. Co., machinist, Eau Claire, Wis., has resigned and John B. Fleming has been appointed to succeed him.

V. A. Moore & Co., Healey Building, Atlanta, have been appointed Southern sales agents of the Wyckoff Drawn Steel Co., Frick Building, Pittsburgh.

The Consolidated Machine Tool Corporation of America announces the opening of a Detroit sales office at 3044 Grand Boulevard, Roland A. Holmes in charge.

The International High-Speed Steel Co., Rockaway, N. J., has moved its New York office from 99 Nassau Street to 143 Liberty Street.

The North American Mfg. Co., Cleveland, has opened a branch office at 53 West Jackson Boulevard, Chicago, to handle low pressure gas and oil burning equipment. Benjamin Sklovsky is district representative.

The Hess spring and axle plant of the Standard Parts Co., in Cincinnati, has been sold by the receiver to Albert J. Mayer, of Cincinnati, for $136,000.

The Aetna Ball Bearing Mfg. Co. has moved to 2737-2745 High Street, Chicago.

Walter F. Henly, who for many years has represented the Leland-Gifford Co., Worcester, Mass., manufacturer of drilling machines, in the New York territory, with offices at 149 Broadway, New York, has added the Philadelphia district to his territory.

The Steelcraft Parts Co. recently incorporated for $100,000 will have the following officers: Charles L. Wasmer, president, Carl E. Kramer, vice-president, John C. Wasmer, secretary, and James J. Lally, treasurer, and will take over the plant of the Structural Tool Co., at 3160 West 106th Street, Cleveland, and will manufacture structural steel tools, including rivets sets, chisel blanks, pistons for riveting and chipping, hammers, chisel bushings, punches and punch dies, hardened and ground bolts. These officers are the same as those which operate the Cleveland Wrought Products Co. at 3590 West Fifty-Eighth Street.

Kerchner & Marshall, Oliver Building, Pittsburgh, have been appointed sales agents by the receiver of the American Manganese Mfg. Co., for the sale of pig iron in the Western territory.

Pittsburgh office of Luria Bros. Co., Lebanon, Pa., iron and steel scrap, has been moved from 936 Oliver Building to room 630, same building.

Herman H. Lind, formerly vice-president and treasurer of the Ohio Body & Blower Co., Cleveland, has opened an office in the Hanna Building, Cleveland, where he will engage in finding purchasers for manufacturing plants, or certain departments of plants, in securing new lines for established businesses and locating opportunities for men who wish to enter new lines of business.

John Younger, formerly general manager of the Standard Parts Co., Cleveland, has opened an office as consultant in management in the Euclid-Windsor Building, 5005 Euclid Avenue, Cleveland. The scope of his work will include various problems of sales, production and finance.

L. B. Marsh has opened a sales office and warehouse for new and second-hand machinery at 1613 St. Clair Avenue, Cleveland. The business will be conducted under the name of the Standard Machinery Exchange.

The Lunkenheimer Co., Cincinnati, will shortly establish a branch agency at Franklin and Pearl Streets, Boston.

The name of the Electric Steel Co., Chicago, was recently changed to Nugent Steel Castings Co. at a stockholders' meeting held in Chicago. There is no change of management, ownership or personnel. Charles Piez is president of the company, W. J. Nugent is vice-president and general manager, Prentiss L. Cooniey is treasurer and C. A. MacDonald is secretary.

The National Steel Rail Co., St. Louis, has moved to its new offices, Suite 1006-7-8-9, Planters Building.

Naylor & Co., Inc., New York, announces that the Stalnaker Steel Co., First National Bank Building, Pittsburgh, has been appointed representative for the territory formerly handled by its Pittsburgh office. The business will be continued under the direction of S. P. Broome, former Pittsburgh manager, now with the Stalnaker Steel Co.

The Franklin Machine Co., Providence, R. I., has purchased property of the American & British Mfg. Corporation in Rhode Island, known as the George H. Corliss Steam Engine Works, and is now in position to manufacture engines and machinery and do machine work of all classes; also to furnish gray iron castings as made at the Franklin shops, the Harris-Corliss Engine Works or the George H. Corliss engine plant of the American & British Mfg. Corporation.

The American Frog & Switch Co., Hamilton, Ohio, formerly represented in the New York district by Presley A. Hamilton, 149 Broadway, New York, has opened a New York sales office at 154 Nassau Street, in charge of R. G. Crawford. The New York office will hereafter quote direct on all the standard and narrow gage track equipment and other standard material manufactured by the company, instead of handling quotations from Hamilton, as formerly.

The Triumph Electric Co., Motors, Cincinnati, announces the removal of its New York office to 25 Church Street, George F. Adams in charge.

Industrial Finance

Stockholders of the Winton Co., Cleveland, and the Haynes Motor Co., Kokomo, Ind., have approved plans for consolidation with the Dorris Motor Co., St. Louis. The new corporation will be known as the Consolidated Motors Corporation, and will have a capital stock of $19,000,000. It is expected that headquarters will be in Kokomo. According to the present plans, the Winton Engine Co., Cleveland, will not become part of the merger.

The Dare Aircraft Corporation, Detroit, organized in the latter part of 1922 for the purpose of manufacturing airplanes and to promote and develop commercial aviation, has filed a petition for dissolution with the Wayne county court. The Michigan Securities Commission originally authorized the company to sell $500,000 worth of stock, and the present situation developed due to the failure of the company to market a very small proportion of the stock issue. Letters of patent are estimated to have a nominal value of $65,000.

The Detroit Edison Co. during the first four months of 1923 had a gross revenue of $11,091,236, as compared with $8,896,501 in 1921; the net, after deduction of expense, interest charges and other items, was $2,101,415, as compared with $1,411,893 last year. The company has offered to its stockholders the right to subscribe for additional stock equal to 25 per cent of their present holdings, at par.

The Montgomery Chemical Works, Detroit, has been reorganized under the name of the Central Steel Treating Company and will increase the capacity of its plant on Buffalo Boulevard. Two or three new furnaces will be added giving this company a capacity of approximately 30 tons per day, with equipment to handle all kinds of commercial heat treating. L. C. Dunn, vice-president, is directing the management of the reorganized concern.

NEW TRADE PUBLICATIONS

Blue Printing Machinery and Accessories.—C. F. Pease Co., 821 North Franklin Street, Chicago. A 64-page catalog, 6 x 9 in., showing complete equipment for the blue print room, including printing, washing and drying equipment in a number of styles and sizes. Both vertical and horizontal machines are illustrated, together with accessories of all sorts, such as cutting and trimming tables, shears, papers and cloths. A price list and discount sheet dated May 1, 1923, goes with the catalog, which is numbered M-23.

"It Interlox."—The Ric-wil Co, Guardian Building, Cleveland. Folder illustrating and describing interlocking conduit of vitrified pipe designed to save loss of heat from underground pipes. Various accessories such as pipe supports, etc., are included.

Heating Rates.—Ric-wil Co., Guardian Building, Cleveland. Pamphlet devoted to interlocking conduit for saving heating loss and giving steam and hot water rates in a large number of cities all over the United States where district heating is in operation. The table is arranged in easily readable form for reference and covers three 8 x 10½-in. pages

Grinding Wheels.—The Abrasive Co., Philadelphia. Small catalog defines abrasives according to the materials from which they are made. Various kinds of wheels and wheel faces are discussed together with meaning of grain and grade. Grain lists are given and tables for the selection of an abrasive for any particular class of work. Tables of wheel speeds, method of calculating list prices and various information pertaining to the choice of abrasives are included. Size 62 pages, 3 x 6 in.

Uniflow Return Tubular Boilers.—Lebanon Boiler Works, Lebanon, Pa. A 24-page booklet describing the evolution of the uniflow boiler frrom the original cylindrical boiler through the various early types and their later improved forms. Features claimed for this new boiler include positive circulation, safety, fuel saving, quick steaming, compactness, accessibility and large overload capacity. Tabular matter and directions for setting the boiler are included, together with a large number of illustrations.

"American" Dust Arresters.—American Foundry Equipment Co., 366 Madison Avenue, New York. Eight-page folder, 7½ by 10¾ in., illustrating and describing dust arresters of the cloth screen type which are self-cleaning by means of vibration. The screens filter the air and collect the dust in hoppers at the bottom. For replacing screens when necessary the hoppers may be removed by simply unbolting. Various sizes are covered in the table, ranging from 250 sq. ft. of effective screen area to 17,290 sq. ft.

"Seventy-five Years of Constant Growth."—Hammacher, Schlemmer & Co., Fourth Avenue and Thirteenth Street, New York. An attractive and easily readable historical sketch touching on important milestones in the development of New York City and of Hammacher, Schlemmer & Co. since 1848. Brief biographies of the founders are given with accounts of important figures in the present organization. Economic changes which hindered or enhanced the growth of the business are noted. Size, 30 pages, 8 x 9½ in.

Fuel Testing.—Pittsburgh Testing Laboratory, Pittsburgh. Bulletin No. 30, 4 pages. Treats of the value of accurate testing of fuel and outlines the inspection service offered by the company. A page is devoted to illustrations showing the detail methods in the six stages of preparing a 1000-lb. sample of coal or coke by hand.

Waste Heat Boiler Plants.—Heine Boiler Co., St. Louis. Book 6 x 9 in., 12 pages. Reprint of a paper on the "Waste Heat Boiler Plant of the Cape Girardeau Portland Cement Co.," read before the Portland Cement Association Nov. 22, 1922, by C. H. Sonntag. Heine boilers were used in this plant and several illustrations of the equipment are given.

Portable Electric Drills.—Independent Pneumatic Tool Co., Chicago. Leaflet illustrating Thor drills at work. Various sizes and types, with attachments, are illustrated and specifications and prices included.

Roofing.—Federal Cement Tile Co., 110 South Dearborn Street, Chicago. Pamphlet devoted to why "a large part of industrial America is covered with Federal" roofing. Among several illustrations of large buildings roofed with the Federal company's tile is the Government balloon hangar at Scott Field, Belleville, Ill., and the interior of the Michigan State Fair coliseum at Detroit.

Pumps.—Duro Pump & Mfg. Co., Dayton, Ohio. Booklet of 40 pages, 8 x 11 in., listing the forty distributers of the company in the United States, Canada, New South Wales, Cuba and China and describing its various types of pumps, the proper water systems to use under various conditions. It illustrates, with specifications, its line of pumps.

Heating Furnaces.—American Foundry & Furnace Co., Bloomington, Ill. A number of illustrations of the company's Solar heat generators, so-called, for warming air for heating factories, school houses and the like.

Overhead Traveling Cranes.—Whiting Corporation, Harvey, Ill. Catalog No. 165, superseding No. 158, containing 88 pages, 6 x 9 in. and about 115 illustrations of Whiting overhead cranes in operation and of their parts. There are also a number of line drawings showing the construction. Careful attention is devoted to electric traveling cranes, bucket-handling, gantry, transfer, handpower, jib, and pillar and bracket cranes as well as lifting attachments, railroad specialties and clearance tables. The company has also issued a booklet of 32 pages on "Operation and Maintenance of Whiting Electric Cranes," the chief value of which is the complete numbered listing of parts, together with illustrations and diagrams as an aid to the user in ordering repair parts.

Files.—Simonds Saw & Steel Co., Fitchburg, Mass. Catalog printed in colors and containing 27 pages of illustrations covering types of files in general use. Three classifications, the single-cut, double-cut and rasp-cut, are described and a page of illustrations shows the variation of the different lengths of single-cut files with flat surfaces.

Bench Lathes.—Stark Tool Co., Waltham, Mass. Catalog of 28 pages, 8½ x 11½, loose leaf form, describing and illustrating the company's precision bench lathes and attachments. A revised index and telegraph code are included.

Standard Die Sets.—Metropolitan Mechanical Works, Inc., 30 Church Street, New York. Folder describing and illustrating standard die sets carried in stock, which comprise six styles and about 40 sizes, dimensions being given for each style and size. The wide variety of sizes and styles, and leader pins or pillars without oil grooves, are emphasized as features. In these sets the top of the die base plate is machined parallel but not ground, the latter being said to be unnecessary.

Sheet Metal Specialties.—The Tarpenning-La Follette Co., 1030 Canal Street, Indianapolis, Ind. A 32-page catalog on industrial sheet metal work, especially complete systems for dust and shavings collection, ventilation, heating or drying for industrial plants. The catalog is profusely illustrated and printed on a fine quality of paper and contains considerable information of value to those buying sheet metal work of this character.

Warehouse Stock List.—A 62-page booklet carrying a list of the various special steel products carried in stock by P. F. McDonald & Co., 17 King Terminal, Boston, who represent two of the principal makers of steel in Sweden and the Page Steel & Wire Co., Monessen, Pa.

Sluice Gates and Hoists.—Champion Engineering Co., Kenton, Ohio. Five leaflets illustrating caterpillar type sluice gates manufactured by the company under Broome patents, also describing Champion hand and power operated sluice gate hoists.

Malleablizing Iron Castings.—Brown Instrument Co., Philadelphia. In a 36-page booklet, 7⅝ x 10½ in., is a treatise on the annealing problem in the modern malleable foundry, based upon data collected from some 40 representative plants. The paper is illustrated profusely with photographs, micrographs and drawings and takes up in detail the making of malleable castings, annealing ovens and other problems, temperature in annealing, temperature control, galvanizing malleable iron castings and other allied subjects. About half the pamphlet is given over to testimonial letters from various plants where Brown pyrometer equipment is functioning.

Sangamo Meters.—Sangamo Electric Co., Springfield, Ill. In a 20-page bulletin, 8 x 10½ in., dated May, are described single and polyphase watthour meters with considerable detail in the shape of wiring diagrams and methods of use and test. Instructions for maintenance and for replacing bearings, magnets, etc., are given as well as testing instructions.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	3.54c.
Swedish bars, base price	7.50c.
Soft steel bars, base price	3.54c.
Hoops, base price	5.19c.
Bands, base price	4.39c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.64c.
Channels, angles and tees under 3 in. x ¼ in., base	3.54c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.80c.
Toe-calk, ½ x ⅝ in. and larger	4.60c.
Cold-rolled strip, soft and quarter hard	7.50c. to 8.50c.
Open-hearth spring-steel	5.00c. to 7.50c.
Shafting and Screw Stock:	
Rounds	4.40c. to 4.65c.
Squares, flats and hex	4.90c. to 5.15c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High speed steel, 18 per cent tungsten	75c. to 80c.

Tank Plates—Steel

¼ in. and heavier	3.64c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.59c.
No. 12	4.64c.
No. 14	4.69c.
No. 16	4.79c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.55c. to 5.05c.	.....
Nos. 22 and 24	4.60c. to 5.10c.	5.35c.
No. 26	4.65c. to 5.15c.	5.40c.
No. 28	4.75c. to 5.25c.	5.50c.
No. 30	4.95c. to 5.45c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.85c. to 5.35c.
No. 16	5.00c. to 5.50c.
Nos. 18 and 20	5.15c. to 5.65c.
Nos. 22 and 24	5.30c. to 5.70c.
No. 26	5.45c. to 5.95c.
No. 27	5.60c. to 6.10c.
No. 28	5.75c. to 6.25c.
No. 30	6.25c. to 6.75c.

No. 28 and lighter, 36 in. wide, 20c. higher

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
⅛ in. Butt..	—41	—24	⅛ in. Butt..	— 4	+19
¼ in. Butt..	—46	—32	¼ in. Butt..	—11	+ 9
1-3 in. Butt..	—48	—34	1-1½ in. Butt	—14	+ 6
2½-6 in. Lap.	—44	—30	2 in. Lap....	— 5	+14
7-8 in. Lap..	—41	—11	2½-6 in. Lap.	— 9	+ 9
9-12 in. Lap.	—34	— 6	7-12 in. Lap..	— 3	+16

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	5.00c.
Annealed soft	5.00c.
Galvanized annealed	5.65c.
Coppered basic	5.65c.
Tinned soft Bessemer	6.65c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	20½c. to 21½c.
High brass wire	21 c. to 22 c.
Brass rods	18¾c. to 19¾c.
Brass tube, brazed	28½c. to 29½c.
Brass tube, seamless	25½c. to 26½c.
Copper tube, seamless	27 c. to 28 c.

Copper Sheets

Sheet copper, hot rolled, 24¼c. to 25¼c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14 x 20	
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Prime	Seconds
		80 lb..	$6.80 $6.55
		90 lb..	6.90 6.65
		100 lb..	7.00 6.75
IC..	$11.00 $9.75	IC..	7.15 6.90
IX..	12.25 11.00	IX..	8.15 7.90
IXX..	13.50 12.25	IXX..	9.15 8.90
IXXX..	14.75 13.50	IXXX..	10.15 9.90
IXXXX..	16.50 14.75	IXXXX..	11.15 10.90

Terne Plates

8-lb. coating, 14 x 20

100 lb	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits pig	45c.
Bar	53c. to 58c.

Copper

Lake ingot	17½c.
Electrolytic	17 c.
Casting	16¾c.

Spelter and Sheet Zinc

Western spelter	8 c.
Sheet zinc, No. 9 base, casks	10¼c. open 10¾c.

Lead and Solder*

American pig lead	8½c. to 9c.
Bar lead	12c. to 13c.
Solder, ½ and ½ guaranteed	32c.
No. 1 solder	30c.
Refined solder	26½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c. to 90c.
Commercial grade, per lb	35c. to 50c.
Grade D, per lb	25c. to 35c.

Antimony

Asiatic	8½c. to 9c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	32c. to 33c.

Old Metals

The market is firm but there is little change in values. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy crucible	12.75
Copper, heavy wire	12.00
Copper, light and bottoms	10.25
Brass, heavy	6.75
Brass, light	5.50
Heavy machine composition	9.50
No. 1 yellow brass turnings	6.75
No. 1 red brass or composition turnings	8.50
Lead, heavy	6.00
Lead, tea	4.50
Zinc	4.25